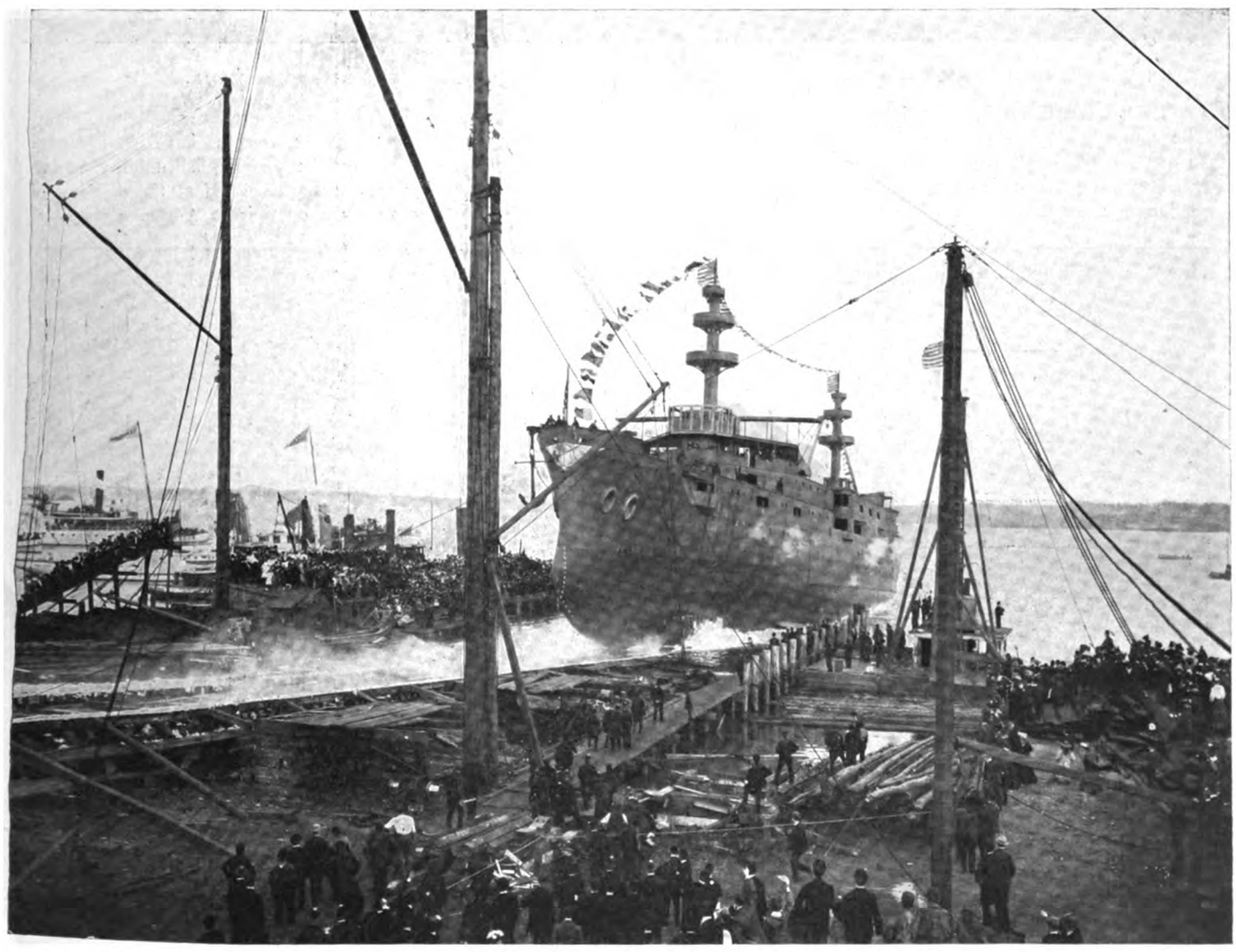
MARINE REVIEW

VOL. XXXI. CLEVELAND, O., MAY 18, 1905. No. 20.

FORE RIVER TWO SCOUTS; BATH ONE.

The recommendations which the naval board of construction have made to the secretary of the navy for the construction of the three scout cruisers—Chester, Salem and Birmingham—contemplate that the Fore River Shipbuilding Co. build one of the vessels, equipped with reciprocating engines and another with turbine engines; the Bath Iron Works of Bath, Me., to build the third with a different type of turbine engines. Of the six concerns bidding for the contracts for these vessels, the Fore River and Bath companies were the lowest for vessels with turbine installation, while the Fore River was the lowest bidder in both classes. The maximum price fixed by law for the construction of these vessels is $1,800,000, but the bids favorably recommended by the construction board are considerably under that figure.



LAUNCH OF THE PROTECTED CRUISER ST. LOUIS AT NEAFIE & LEVY'S SHIP YARD, PHILADELPHIA.

The turbine engine will be something entirely new to the

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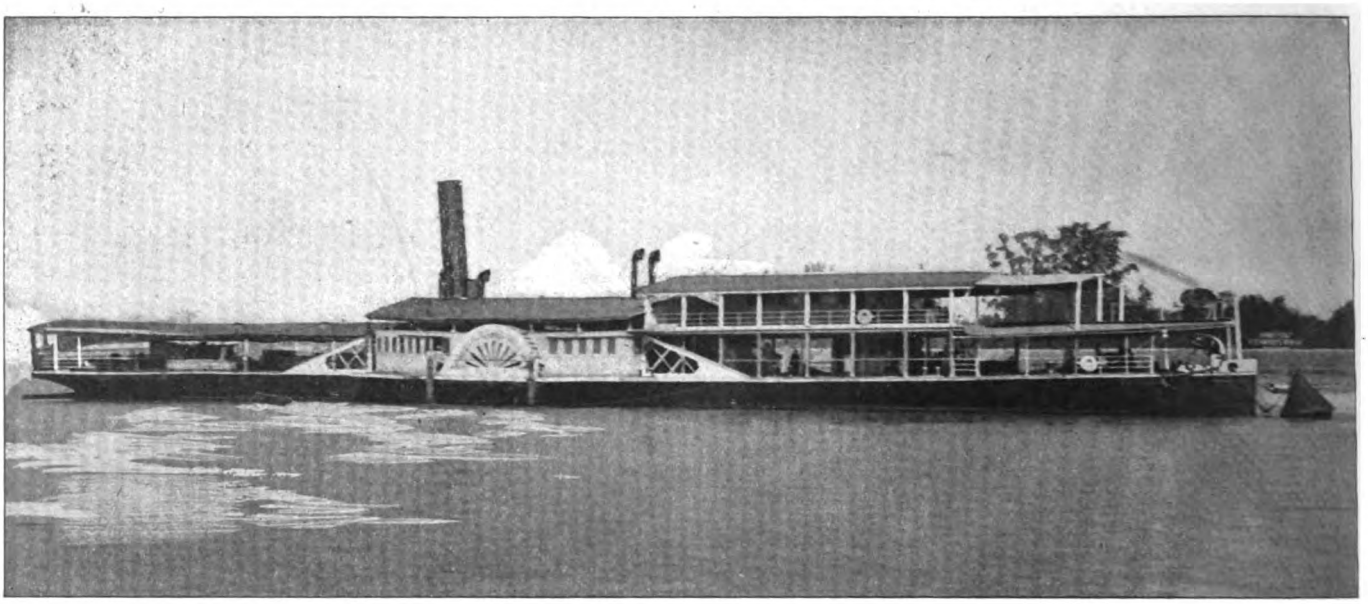
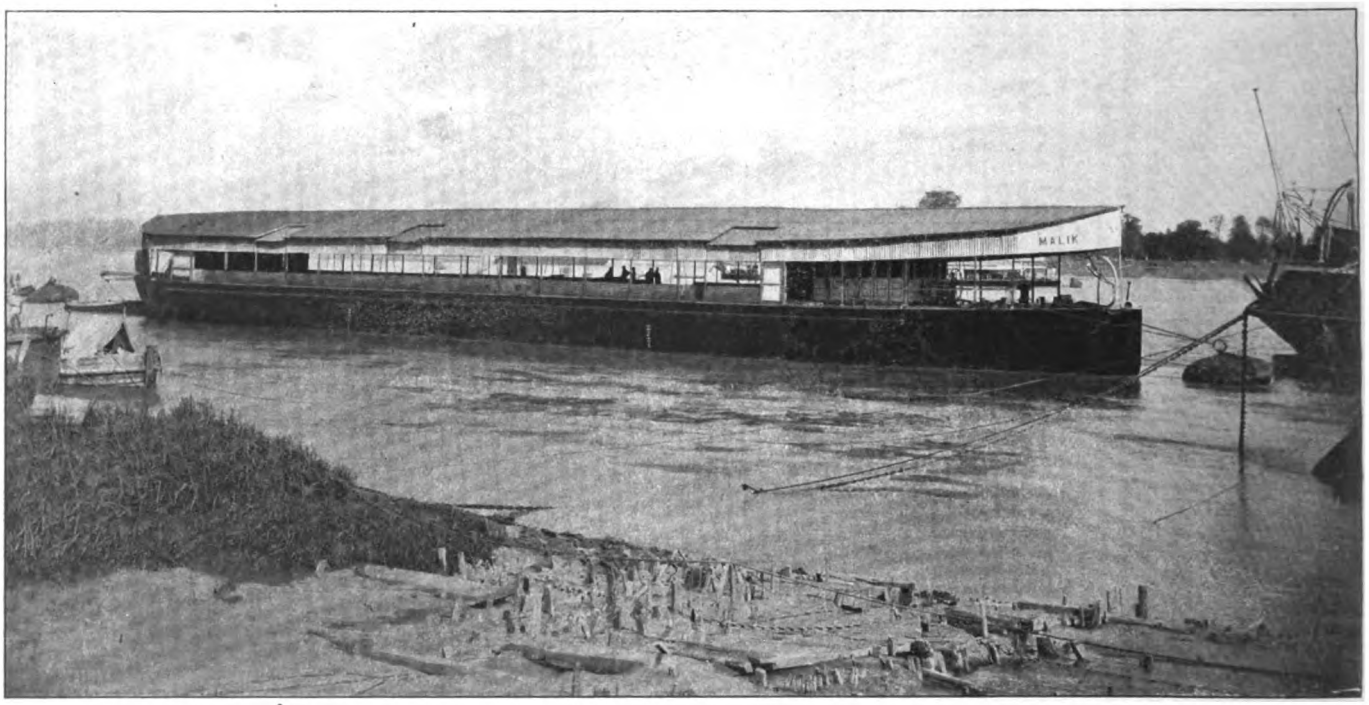
American navy, and will be given its first trial in a United States man-of-war when installed in the scouts, which are required to make a maximum speed of 24 knots. In addition to high speed these vessels are to be so constructed as to have a great steaming radius. One of the turbine engines to be installed is an American type, while the other is English.



THE SITAHAMPUR, A TYPE OF TUG BOAT USED FOR TOWING FLATS ON THE RIVERS OF INDIA.

INDIA GENERAL STEAM NAVIGATION CO.

The company whose history is here related attracts more than ordinary share of attention usually accorded to a commercial venture, inasmuch as the story of its inception and career mark a distinct epoch in an important branch of Indian affairs. The India General Steam Navigation Co. was the pioneer of private enterprise in the inland waters of India. It is still the largest as it is also the oldest company engaged in river navigation in the East. And its history forms the connecting link between the old tedious boat journeys of the early years of British occupation and the present rapid development of railways over the country. The company started some sixty years ago. The history has been carefully written by Capt. A. Brame, the present marine superintendent, who gives a very interesting account of the doings of this company from the time of starting. Although railways and other competition has gone against them in late years, they have been able to hold their own, and pay a good dividend to the shareholders. Railways will never be able to carry produce at the same rates as the steamers and pay. Those steamers have carried some of the most distinguished members of English nobility as passengers. One of the steamers was placed at the disposal of Lord and Lady Curzon when on tour to Assam a thousand miles up the Brahmaputra river to Debenghur and back to Calcutta. They were well pleased with the accommodation and arrangement that had been prepared for them. The photos are the main line steamer "Sitahampur," a tug boat only towing flats, the Malit, one of the flats towed by her, the Condar, of



THE MALIK, A TYPE OF RIVER STEAMER USED IN INDIA.

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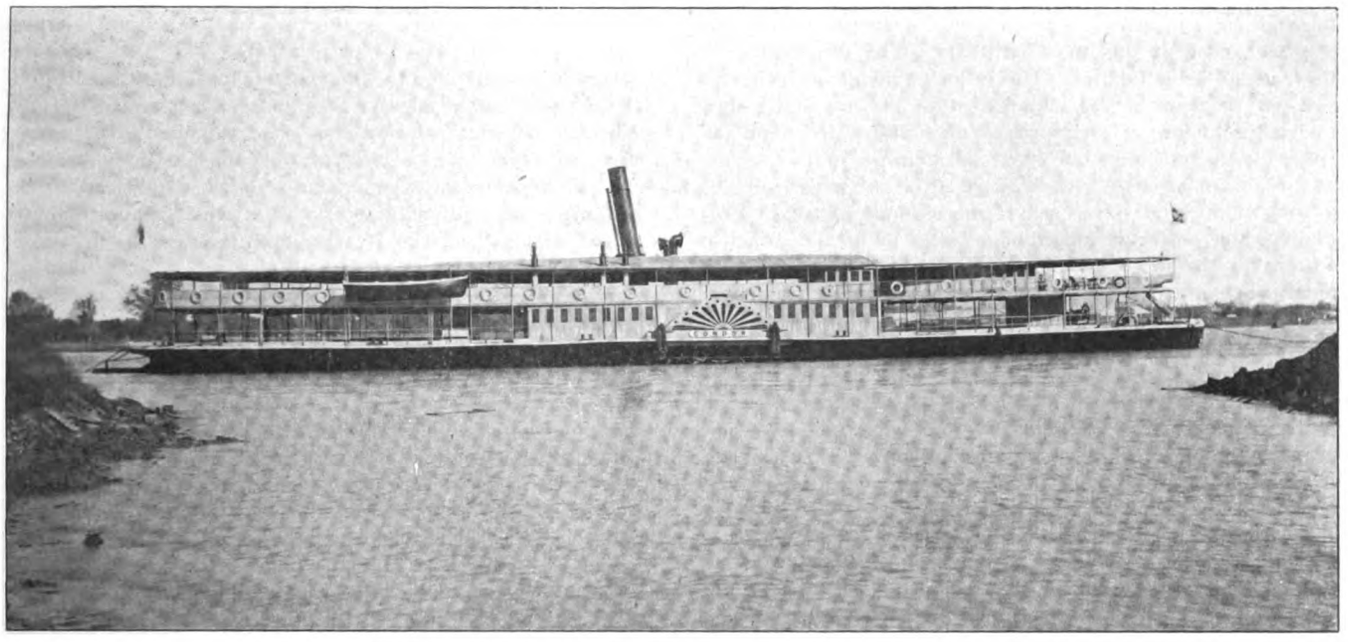

THE CONDOR, A TYPE OF RIVER STEAMER USED IN INDIA.

the class of steamers that carries mails and passengers. The company has twenty-five main line steamers, forty passengers and mail, twenty stern wheelers and feeders, thirty canal and launches, 100 cargo flats, twenty receiving flats at the station and sixty cargo barges which bring tea from the gardens to the feeders. A big fleet to look after, has its own dock yard and workshop, where all the company's work is done.

LIVERPOOL SHIPPING LETTER

Liverpool, May 8.—I have before me the monthly report of the Liverpool Underwriters' Association, which deals with casualties to vessels of 500 tons and upwards posted in the Loss Book during the month ended April 30. I gather therefrom that the number of total losses was fifteen steamers and sailers of 24,588 tons, compared with fourteen vessels of 19,056 tons in April, 1904. These included one British sailer of 1,331 tons and three British steamers of 6,728 tons, and four foreign sailers of 2,533 tons and seven foreign steamers of 13,996 tons. During the past month the partial losses numbered 347, and included fifteen British and 34 foreign sailers, and 172 British and 126 foreign steamers. The causes of the casualties referred to were: collisions, 123; strandings, 111; weather damage, forty-two; damage to propeller's machinery or shafts, thirty-eight; fires and explosions, thirty-three; missing, three; founderings and abandonments, two, and other casualties, ten.

It is now possible to give some particulars of the two new fast steamers that are about to be built for the Atlantic service of the Canadian Pacific Railway Company. Sir Thomas Shaughnessy, the president of the C. P. R. Co., in an interview before he left Liverpool on Tuesday last on board the Cunard liner "Caronia" for New York, said that the two magnificent steamers just ordered would be ready about April of next year. They would not be quite as big as the "Caronia," being about 16,000 tons each, but their speed, 18 knots, would make them the fastest boats in the Canadian steamship service, and the Canadian Pacific Railway intended to make them the equal of the "Caronia" in elegance and comfort. He also said the company had no intention of deserting St. John, N. B., their Canadian winter port, as had been rumored, but he felt that the company would ultimately be compelled to do so unless St. John provided the necessary facilities. This is all the information that Sir Thomas Shaughnessy deigned to give before his departure from these shores, but it is now authoritatively stated that the dimensions of the new steamers will be: length, 550 ft.; breadth, 65 ft.; depth, 45 ft., and a gross register of 16,000 tons or thereabouts. The ships will have eight decks and their service speed will be 18 knots, although the power provided will make them capable of doing nearly 20 knots on trials. They will each have two sets of quadruple expansion engines driving twin screws. This increased speed of 18 knots is a great advance on the 13½ knots which is said to be the fastest service speed of the present Canadian Pacific Railway Atlantic steamers.

Certain details are available through sources which may be regarded as authoritative concerning the battleship to be built at Portsmouth in the autumn which Mr. Arthur Lee, M. P., Civil Lord of the Admiralty, promised to be the most powerful battleship the world has ever seen. The new battleship is to be of 18,000 tons displacement, her length, draught and beam are being restricted to such dimensions as will enable her to pass over the dock sills and occupy the dry basins of the home dockyards and of the new naval works at Gibralter. In order to attain this reduction of measurements without a corresponding reduction of displacement, Dr. Philip Watts has laid off the new ship on abnormally full lines. As shipbuilders say, she is all body, and a midship section of her shows practically as a square, with the smallest degree of rounding off at the lower corners for bilge curves. Furthermore, she will have higher freeboard than any previous type of British battleship. Against the disadvantageous aspect of this feature of design, causing the ship to offer a bigger target to an enemy's fire, must be set the fact that her own artillery is carried to a greater elevation, enabling better shooting to be made, and the guns to be fought effectively in heavy weather. Apparently Dr. Philip Watts is aiming at the battleship ideal pure and simple, without seeking to embody the mobility of the modern cruiser, as America and Italy are very successfully doing. His new ship is to be a floating fortress with aggression as the keynote of her whole design. She will mark the advent of the high calibre heavy fore gun, and materialize the doctrine of homogeneity of armament so highly favored by Admiral Sir John Fisher. Reports as to the number of guns she will actually carry must at present be regarded as tentative, because in no feature of battleship construction is there more frequent modification of original specifications. In well-informed dockyard circles, however, it is known to be under consideration

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to adopt eight 12-inch, and ten 9½-inch weapons as the primary armament of this new battleship. The distribution of these would be as follows: The 12-inch guns mounted in two pairs in the forward and after barbettes, and one apiece in a turreted gunhouse at each angle of the battery deck, and the ten 9½-inch guns mounted five a side on broadside. A group of three-pounders will be the biggest of the minor weapons for dealing with what naval men term mosquito attack. Prodigious gun power is indeed manifestly to be the principal feature of the new battleship, and a larger degree of ammunition than usual is mentioned. The method of armor distribution has not yet been determined upon, although it is definitely stated that 10-inch Krupp will form the broadside belting, and that this will probably be built into the hull in much the same fashion as in the Lord Nelson class, designed by Dr. Philip Watts. The ram, it is said, will doubtless disappear in the new ship, having grown beyond the stage of feasible utility. Owing to the development of displacement and speed, the intention at present is not to attempt anything phenomenal in the way of speed, nineteen knots on full contract power being the limit laid down. It is rumored that the vessel will be propelled by turbines, actuated by oil fuel, but responsible dockyard officials regard this as a premature and improbable assumption. It is safe to predict that all conceivable facilities for the delivery of torpedo attack and every possible provision against submarine aggression will mark Dr. Philip Watts' appreciation of the lessons of the present war in the East.

The Cunard Steamship Company have just had prepared a huge painting representing one of the two leviathan turbine express liners now building for the Liverpool-New York service. The canvass is 18 ft. by 9 ft., and the work has been executed by Mr. C. Arthur Cox, the well-known "Graphic" artist. This picture has been painted specially for exhibition in the offices of the Cunard Co. at Chicago, and will go forward now very shortly, probably by the next mail boat. Americans will thus be able to get a very good idea of what these mammoth ships will be like when afloat. It shows one of the "flyers" steaming on the open sea at full speed. By way of contrast the artist has introduced in the foreground a portrait of the first Cunarder "Britannia," and the contrast between the two ships is very striking indeed. The "Britannia," from Liverpool to Boston in 1840, was a paddle wheel steamer of 1,154 tons gross and 750 I. H. P. These new "flyers" will be 800 ft. in length, of 30,000 tons gross register, will be fitted with turbine engines developing 700,000 I. H. P. and are to steam 25 knots. Each vessel will have four funnels, and owing to the vital parts of the amidships being protected on each side by coal bunkers, six feet thick, in accordance with Admiralty requirements, the engine room and stokeholes extend to a greater length than usual. Hence, like fast cruisers and torpedo destroyers, they will have four funnels. I have heard it said that the Americans, being accustomed to big things and tall figures, the Cunard management have thought it advisable to impress them with the great size and importance of these vessels to have this huge picture prepared solely for American exhibition.

In this connection I learn that Messrs. John Brown & Co., Clydebank, are keeping as many men on the turbines of the intermediate Cunarder "Carmonia" as can find room to work around them. They are determined to have the vessel completed as soon as possible in order that she and the Caronia may be running on the Atlantic this summer, and affording an illustration of the relative values of turbines and reciprocating engines in these twin vessels. In order to save time they have had engineers working at holiday rates, while the other departments of the yard were idle, and they have made a special arrangement with the Amalgamated Society of Engineers, by virtue of which the society has set aside all its regulations as to overtime, and allows the firm to keep men working at these particular turbines day and night, Sunday and week-day, so long as they are paid the usual overtime rates.

From a return of the shipping for 1904 just issued by the Suez Canal Co., it appears that the total net tonnage passing through the canal during the year amounted to 13,402,000 tons, being an increase of 1,495,000 tons. The increase in British shipping was as much as 1,430,000 tons, Germany being next, but with only 196,000 tons, while France shows a slight decline, and the Russian and Japanese totals are, of course, lower.

It has been for some time foreseen that the traffic returns at Bristol docks would not, in the year which closed on April 30 last, give as good a result as was achieved in the previous twelve months, when a record was obtained. The dock statistics just issued, therefore, cause no surprise. Foreign tonnage amounted to 1,000,469 tons, a decrease of 96,260 tons, while coastwise totalled 1,071,874 tons, an increase of 58,264 tons. Dock dues decreased $85,220. The setback is due to causes affecting all ports in which the North Atlantic trade bulks largely, business having been dull for some time past, owing to the check in both United States and Canadian grain shipments. The mild winter and abundant grass has besides lessened the agricultural demand for feeding stuffs, also an important line in Bristol's import trade. The returns have not affected the sanguine feeling with regard to the prospects of the port held by the dock authorities.

The vessels launched from Scottish shipbuilding yards during April number thirty-six, and measure altogether about 38,490 tons. In March the total was twenty-nine vessels of 45,640 tons, and in April of last year it was thirty-four vessels of 39,421 tons. The four months of this year have produced altogether ninety-one vessels of 153,206 tons. Last year the total for the corresponding period was 102 vessels of 141,813 tons. This year, therefore, the number of vessels is less by eleven, but the measurement is up by 11,393 tons. The tonnage for the four months is higher than that of 1902 for the same period by 546 tons, and as 1902 as a whole year broke all records in the matter of output, it will be seen that 1905 so far is promising very well. At present, however, the whole Clyde is threatened with trouble over the wages question, and although it is not anticipated that the example of the patternmakers will be followed by any of the other purely shipyard or engineshop workers, the position is doubtful enough to make one chary of prophesying that the end of the year will see the figures in as satisfactory a position as at present. Very few contracts were reported during the month, and the total makes only about 15,800 tons.

The Shipping Gazette correspondent on the east coast says it is satisfactory to find that the Cleveland iron and steel trades have during April taken a distinct turn for the better. The shipments of pig iron for the month amounted to 83,719 tons, or 17,988 tons more than for March, while the export of manufactured iron is 12,603 tons, and of steel 27,021 tons, or together nearly 1,000 tons more than the previous month. Not a little of the improvement is due to the special demands from America and from the Far East. To Canada, Tees-side shippers last month sent 4,975 tons of pig iron, and 7,600 tons of manufactured iron and steel. To the United States 3,300 tons of pig iron; to Hong Kong 2,900 tons of pig iron, and to Japan 8,464 tons. The business with Canada and the United States is new, and due to the iron trade "boom" in these countries, coupled with the fact that we can send them raw or partly manufactured material at a low price to be worked up on the other side. The business with the Far East is not exactly new but it is increasing, stimulated no doubt by the unusually low freights ruling from the Tees-side, owing to the freight war between the British and German lines; and when the war between Russia and Japan is over a great impetus to this trade is expected, for Japan, while recuperating her industrial resources after the war is regarded as a coming customer of especial value to this country.

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SITUATION AT BUFFALO

Buffalo, May 16.—Situations continue to come and go in marine matters quite as fast as they used to when the days following the appearance of the steamer Onoko in 1882 set the people to watching the rise of the metal hull, which was given such a send-off by this "floating boot box" as some people who viewed her no-beauty lines were wont to call her. She carried the broom for a long time easily and even when she began to fall into second class I recall being told by her master, Capt. Trinter, who brought her out I think and was the commodore of the fleet to which she belonged for a long time, that he was not at all alarmed as to her leadership. He could load more grain than any of them yet and he was going to show her ambitious rivals that he could some day when things came right.

We are now looking with some confidence for the 600-footer, being quite close enough to the mark to warrant it, but what are our poor harbors going to do with them? We are trying to get Buffalo to deepen Buffalo creek a few more miles and kill two birds with one stone, by also abating the early floods that prevail in that district. I asked some one who understands the situation if it would be possible to provide a winding place up stream for the big craft and he said no, it would take a great part of the township that was asking flood relief, and he was not a tug owner either. The improvement is now looked on as pretty certain to happen and I would beg leave as an interested amateur to suggest that all lake vessels built hereafter be two-enders, like the New York ferry boats, so that they can swap fore and aft at a moment's notice. It would all be very easy after that.

There are new things at the Buffalo ship yard, too, of late, especially since the fire of a month or so ago. Fires are sad destroyers, but they so often pave the way to improvements that the town or institution that is entirely fire proof would be left out of sight in the race in a short time. For some time after the building of the great traveling crane at the Buffalo ship yard it was the wonder of common people and met the entire approval of experts, but now it is found that it is not just the appliance that is most needed. This opens a chapter in trade unionism, which need not be elaborated here, but it is a fact that the ship yard authorities have been so annoyed and have lost so much money by strikes in late years that they do not dare to do much building here.

All this is a sad state of things and it is really more of a loss in its way to the workmen than it is to the builders, for they can set up their ships in towns that are not tainted with the strike spirit and poor Buffalo gets left, town as well as workmen. So it appears that this port is pretty nearly confined for the time to repair work in marine matters, and it cannot be denied that this branch of the business has been made the most of lately, though I have no figures with which to make comparisons with other ship yards. Some day, when the men can be depended on to finish a job they undertake, new craft may again be created here safely, but not till then.

So it is the plan, possibly not yet fully matured, to take down the big ship building crane, so long the pride of the dry-docks, and build in its place a locomotive crane, as it is called, which is suited to heavy carrying from the shop to all the four dry-docks and will save a great amount of the work now needed to cover them. As the present crane is only suited for handling heavy stuff between the shops and a vessel on the stocks its usefulness is really too limited, considering its cost.

Then there are new notions to be introduced in the rebuilt shops that would appeal mostly to a workman up in that line, but they show the utility of fires and the great secondary importance of fire insurance companies, which are so obligingly ready to pay a round sum for all sorts of things that were fine a few years ago, but are so entirely out of date now that it is really a loss to use them any longer and prove after awhile a decided handicap to anyone who will consent to keep them in use.

We are watching now the hopper-bottomed lake vessel. Buffalo has some ideas in that line and it is claimed that they have lately gone into use without leave of the inventor of them, so that there is likely to be after proceedings in the case. It is confidently claimed that this idea is capable of elaboration till there will be no need of a man in the hold for either loading or unloading bulk freight, no matter what it is. If it is used it may supersede the Ogdensburg sweepers, which are here and have been all equipped for more than a year, but are not thought to be well enough intrenched for any set-to with the scoopers just at present, so they are merely held in reserve.

JOHN CHAMBERLIN.

SUMMARY OF NAVAL CONSTRUCTION

The monthly summary of Naval construction shows the customary progress upon naval vessels with the interesting information that the lead of the Louisiana over the Connecticut is but little over 1 percent. Following is the summary:

		Degree of completion, per cent. Apr. 1,'05.	May 1,'05.
BATTLESHIPS.			
Virginia	Newport News S. B. & D. D. Co.	83.74	85.53
Nebraska	Moran Bros. Co.	69.31	70.89
Georgia	Bath Iron Works.	76.44	77.78
New Jersey	Fore River Ship Building Co.	79.4	81.1
Rhode Island	Fore River Ship Building Co.	84.	86.
Connecticut	Navy Yard, New York.	70.24	73.56
Louisiana	Newport News S. B. & D. D. Co.	71.90	74.83
Vermont	Fore River S. B. Co.	45.4	47.2
Kansas	New York Ship Building Co.	48.1	51.4
Minnesota	Newport News S. B. & D. D. Co.	61.76	63.18
Mississippi	Wm. Cramp & Sons.	24.39	27.04
Idaho	Wm. Cramp & Sons.	22.27	24.93
New Hampshire	New York Ship Building Co.	1.5	3.2
ARMORED CRUISERS.			
West Virginia	Newport News S. B. & D. D. Co.	99.95	100.
California	Union Iron Works.	73.5	75.
Maryland	Newport News S. B. & D. D. Co.	99.	99.95
South Dakota	Union Iron Works.	71.3	72.9
Tennessee	Wm. Cramp & Sons.	69.45	71.80
Washington	New York Ship Building Co.	70.2	74.2
North Carolina	Newport News S. B. & D. D. Co.	2.15	3.25
Montana	Newport News S. B. & D. D. Co.	2.01	3.20
PROTECTED CRUISERS.			
St. Louis	Neafie & Levy S. & E. B. Co.	60.6	63.
Milwaukee	Union Iron Works.	69.8	72.4
Charleston	Newport News S. B. & D. D. Co.	92.56	93.78
GUNBOATS.			
Dubuque	Gas Engine & Power Co.	90.9	94.28
Paducah	Gas Engine & Power Co.	82.8	83.9
TRAINING SHIPS.			
Cumberland	Navy Yard, Boston.	95.	95.
Intrepid	Navy Yard, Mare Island.	95.	97.5
TRAINING BRIG.			
Boxer	Navy Yard, Portsmouth.	99.5	100.
TORPEDO BOATS.			
Goldsborough	Wolff & Zwicker.	99.	99.
O'Brien	Lewis Nixon	99.	99.
COLLIERS.			
Erie	Navy Yard, New York.	0.	0.

A 4,600-ton caisson, specially constructed for raising the French armored cruiser Sully, sunk in Along bay, Tonquin, in February last, was launched at Hong Kong last week and will be taken to Saigon.

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DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED OR ASSOCIATED WITH MARINE MATTERS ON THE FACE OF THE EARTH.

Published every Thursday by

The Penton Publishing Company,

CLEVELAND, OHIO.

CHICAGO: MONADNOCK BUILDING.
PITTSBURG: PARK BUILDING
NEW YORK: 150 NASSAU STREET.

Correspondence on Marine Engineering, Ship Building and Shipping Subjects Solicited.

Subscription, $3.00 per annum. To Foreign Countries, $4.50.
Subscribers can have addresses changed at will.

The Cleveland News Co. will supply the trade with the MARINE REVIEW through the regular channels of the American News Co.

Entered at the Post Office at Cleveland, Ohio, as Second Class Matter.

MAY 18, 1905.

It does not require the appointment of an Isthmian Canal Commission to discover that it costs more to build vessels in the United States than it does in Great Britain. That fact was very clearly known long before the Panama Canal commission was appointed. It is announced in the newspapers that the canal commission wants two cargo steamers and finds that it can build them much more cheaply and much quicker in Britain than in the United States. President Roosevelt has accordingly instructed the commission to buy them where they can be procured the cheapest. Now the president of the United States well knows that this is not giving the American ship builder the shadow of a chance. It was at President Roosevelt's instigation that the Merchant Marine Commission was appointed to make a tour of the country to inquire into the general state of American shipping in the foreign field. There is reason to expect from what the president stated prior to the appointment of the commission and what he has stated in his messages since that he would assume a friendly interest for the American ship builder and that he would be in favor of the extension of any reasonable help to that field of industry. But to order the canal commission to buy ships where it can buy them cheapest while everyone knows that owing to the fiscal policy of the country it is impossible to build them as cheaply in this country as abroad, is certainly not a friendly act. The president must know that material is higher in this country than it is in England; he must know that wages are higher here than there. Therefore, how can he expect the American shipbuilder to compete. It is not fair play to protect every industry and leave one important part of industrial enterprise unprotected. To employ the president's own words, it isn't a square deal. Protection should either be extended to all or be abolished altogether. There isn't any talk of changing this policy, however, and therefore the injustice which it exercises to ship building should be recognized and compensated for in other ways. A great deal of noise was made over the fact that the American ship builders could not promise delivery within a less period than eighteen months. On the great lakes a 10,000-ton ship will be delivered complete to its owners four months after the contract for its construction has been let. How is this possible? Because ship building on the great lakes has been specialized; because ships are really manufactured and not built on the great lakes. The cause of this expertness is practice; the shipbuilders of the great lakes have had abundant opportunity to perfect themselves in the art of ship building. They are peculiarly protected and are free from ruinous foreign competition. The ship building industry of the coast, if permitted to specialize through an abundance of orders, would speedily build ships quite as quickly as they are built on the great lakes. The trouble is they do not have the chance to build them and it is just such action as has been taken by the president that prevents them from having a chance. The government is really hostile to the American ship. The three volumes prepared by the Merchant Marine Commission from its tour shows very clearly the nature of this handicap. The Panama canal is not going to be built within the next eighteen months. They will be working on it for ten years or more. Why not give these contracts to the American ship builder even if it is going to take eighteen months and charter tonnage meanwhile? Surely there is enough tonnage in the coasting trade to take care of the shipments to Panama.

In his annual report which has just been printed, United States Consul John J. Kehl of Stettin, Germany, states that 3,485 vessels entered and 3,438 cleared from Stettin in 1904, not one of which carried the American flag and he pertinently adds: "The sole right of carrying 90 per cent of our exports seems to be deeded over to foreign ship owners who are thus paid a subsidy in the form of freight charges of $100,000,000 a year. The marine freight paid by the United States together with passage money paid by American travelers will reach 50 per cent of the gross earnings of all ocean going vessels." Is it not about time that the United States came to its senses and did something for the American ship?

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ORE SHIPMENTS ARE HEAVY

Duluth, May 16.—Ore shipments are about at the maximum on the Mesabi range, though the old ranges are not hustling so fast as they have no more of an allotment for the year than they can get out without difficulty. The burden of the year's tonnage is coming on the Mesabi range. Marquette shipments are not especially heavy, and those of the Gogebic, though large, are not more than is usual in the height of the season. There the steam shovels began work very early and the maximum business comes almost at once, instead of during the two midsummer months. The Duluth & Iron Range road is now hauling to docks as high as 1,500 cars of ore single days, each car carrying about 30 tons on the average. The daily average is better than 1,000 cars. Sunday work has commenced on this road and at the mines served by it, and will doubtless continue steadily all the season. Neither the Duluth, Missabe & Northern nor the Great Northern have yet reached the heavy business of the Duluth & Iron Range, for neither of them are quite in condition for maximum business yet. On the Menominee range there is a heavy business, and the mines of Crystal Falls, in particular, are very busy. Steam shovel shipment from stock pile and shipping direct from shafts are progressing with the utmost speed.

FREIGHT SITUATION

The freight market is steady. Indications are that iron ore shipments will be exceedingly heavy during May. Ore vessels are having good despatch, being loaded and unloaded with little delay and the volume of ore moved during the month will probably be greater than it has ever been during May.

The price of fuel coal on the lakes is again uniform. M. A. Hanna & Co., which cut the rate to $2.10 at Ashtabula, has advanced its figures to $2.50 per ton and hostilities between this concern and the Pittsburg Coal Co. have been declared off, in fact the latter company, as far as can be learned, did not shade its rate when Hanna & Co. cut prices five weeks ago.

Reports from Pittsburg are to the effect that coal from that district for lake shipment will soon be forwarded in large quantities, and vessel owners after June 1 will not experience the difficulty they have had in securing coal cargoes. One reason for the poor movement of coal has been the condition of the upper lake coal docks. The effort to shade the soft coal rate to 40 cents from Ohio ports to Milwaukee was unsuccessful, as owners refused to charter at that figure.

CONTRACTS FOR THREE FREIGHTERS

The American Ship Building Co. now has contracts for the construction of eleven coarse freighters for delivery at the opening of navigation, 1906. Three contracts were closed on Tuesday, two with the Gilchrist Transportation Co. of Cleveland, and one with E. D. Carter of Erie, Pa. The Gilchrist boats are to be duplicates, 534 ft. long over all, 514 ft. keel, 54 ft. beam and 31 ft. deep. They will have a carrying capacity of over 9,000 tons, will be equipped with two Scotch boilers and triple-expansion engines with cylinder diameters 22½, 36, 60 by 42 in. stroke.

The Carter boat will be 524 ft. over all, 504 ft. keel, 54 ft. beam and 31 ft. deep. She will have two Scotch boilers and triple-expansion engine with cylinders diameter 23½, 38, 63 by 42 in. stroke. This new tonnage aggregates $1,000,000 in value.

Mr. H. C. Barrell, who has bought the steamer Frontenac to operate between Cleveland and Lorain, says that the steamer will probably leave Chicago next week. The Lorain Transit Co. will be formed to operate the steamer. Truman Moore of Lorain will be captain and J. Stanley Brown of Detroit will be clerk.

CAPT. THOMAS ELLIS DROWNED

Capt. Thomas Ellis, master of the steamer H. B. Hawgood, fell overboard from his vessel while about 50 miles above Long Point on Lake Erie on Thursday last. No one saw him fall nor was his absence noted for about an hour when one of the sailors was sent to the pilot-house to see why he was not reporting for breakfast. The announcement was then made that the captain had been relieved an hour before and had started for breakfast. An alarm was immediately given and the entire vessel searched for the missing master. The body of Capt. Ellis was recovered by the crew of the steamer Lizzie Madden on Sunday night. There were several cuts in the forehead, temple and nose, and it is believed that Capt. Ellis has been seized with a fainting fit before falling into the water. This theory is borne out by a conversation which Capt. Ellis had with Supt. Wm. McNiff of the Richmond elevator at Buffalo just prior to his last trip. Capt. Ellis accepted an invitation to dinner with Supt. McNiff, who was a life long friend, just before sailing and stated at the table that he was of late subject to fainting spells and feared that he would be unable to complete the season. He said it was his intention to retire by reason of it after a trip or two. It is believed, therefore, that in passing along the deck from the pilot-house to the dining room he was attacked by this illness and fell over the low rail of the steamer into the lake. Capt. Ellis was sixty-two years old and was one of the best known masters on the lakes. He had sailed in the vessels of the Hawgood fleet for the past twenty-two years. He leaves a widow, three sons and a daughter.

CAPT. JOHN MITCHELL'S VIEWS

Shortly after Capt. John Mitchell placed orders with the American Ship Building Co. for two 10,000-ton steamers he followed it up with a third order for a 6,500-ton boat. Capt. Mitchell is regarded as one of the shrewdest vessel managers of the lakes and considerable comment was caused by the order for the smaller boat, a few desiring to know why it was that he had reversed himself, as it were. Capt. Mitchell was asked about this at the launch of the Walsh and he frankly stated that as an independent vessel owner he believed the smaller boat to be more serviceable, saying that he could place a 6,500-ton boat four times while he was placing the 10,000-ton boat once. He also added that it was not always possible to get a full cargo for the larger ship, and that 6,500 tons was a good and convenient sized vessel to have. He also stated that he thought there was too much large tonnage on the lakes.

PALMER SUNK ON LAKE SUPERIOR

In a dense fog about 45 miles east of Copper Harbor on Lake Superior the steamer Harvard collided with the steamer Palmer early Tuesday morning and sank her. The Palmer was struck on the port side between tanks No. 1 and 2 and was almost cut in two. Her crew had barely time to escape to the Harvard before the Palmer went down in deep water. The Palmer was a composite steamer built of steel and wood and was owned by Wm. Livingstone and Ex-senator Thomas W. Palmer of Detroit. She was built by the Detroit Dry Dock Co. in 1889 and was 281 ft. keel and 41 ft. beam. The Harvard was also badly damaged in the collision but reached Sault Ste. Marie safely.

The new steamer Stephen M. Clement building for Capt. John Mitchell of Cleveland will be launched from the Lorain yard of the American Ship Building Co. at 10:30 Saturday morning. She is a duplicate of the Philip Minch and the Ball Brothers, both of which were built at Lorain.

Laird & Son, Ashtabula, O., launched last week a small vessel for use in government work. It is 36 ft. long, 7½ ft. beam and will be equipped with a 7 H. P. steam engine.

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COMMERCE OF LAKE SUPERIOR

Mile-ton Report of the Sault Ste. Marie Canal is of Absorbing Interest—31,546,106 net tons of Freight were Carried Through the Canal in 1904 and $21,552,894.30 was Paid the Vessels for Carrying It—The Value of the Freight was $358,306,300

It has been said frequently in these columns that there is no adequate measure of the port to port commerce of the great lakes, and therefore no way of determining the total commerce of the great chain of waters. However, it is fair to assume that more than half of the commerce of the lakes passes through the canals at Sault Ste. Marie, and it is fortunate indeed that records at this point are very reliably kept by the officials in charge of the United States and Canadian canals. Gen. Supt. Joseph Ripley has just submitted to Maj. W. L. Fisk for transmission to the secretary of war the exhaustive report of canal commerce for 1903 that is known as the mile-ton report. The report shows that $21,552,894.30 was paid as carrying charges to vessels that moved 31,546,106 net tons of freight through the canals in 1904, and that the total value of freight was $334,502,686. The cost per ton per mile of moving this freight was .81 of a mill against .92 of a mill in 1903, against .89 of a mill in 1902 and against .99 of a mill in 1901.

The total freight traffic of 31,546,106 net tons for the season of 1904 when compared with the season of 1903 shows a decrease of 9 per cent or 3,128,331 tons. This decrease is due partly to the late opening in navigation, but principally to the strike of the Masters' and Pilots' Association which was in force from the opening of navigation to June 13. The items showing an increase are grain other than wheat, manufactured iron and pig iron, building stone and general merchandise. The total number of passengers was 37,695, a decrease of 17,480, or 32 percent. Vessel passages through both canals numbered 16,120, showing a loss of 2,476 or 13 per cent from 18,596 passages in 1903. The total lockages numbered 10,315, a loss of 1,327 lockages or 11 per cent. The season of navigation continued for a period of seven months and 27 days during which time the average monthly traffic was 3,993,178 tons.

The traffic through the American canal was 84 per cent of the total freight and 57 per cent of the passengers carried, the amounts being 26,517,916 tons of freight and 21,606 passengers. Compared with the season of 1903 there was a decrease of 2,654,336 tons of freight or 9 per cent, and a decrease in passengers of 1,550 or 7 per cent. The American canal opened May 5 and closed Dec. 13, 1904, making the length of its season 223 days.

The traffic through the Canadian canal was 16 per cent of the total freight and 43 per cent of the passengers carried, the amounts being 5,028,190 tons of freight and 16,089 passengers. Compared with the season of 1903 there was a decrease of 473,095 or 9 per cent, decrease of 15,930 passengers or 50 per cent. The Canadian canal was opened on April 30 and closed Dec. 26, making the length of its season 241 days. Following are some of the most interesting conclusions regarding the traffic of 1904:

Total mile-tons	26,608,815,636
Total freight carried, tons	31,546,106
Total valuation placed on freight carried	$334,502,686
Average value per ton of freight carried	$10.60
Total amount paid for freight transportation	$21,552,894.30
Average distance freight was carried, miles	843.5
Cost per mile, per ton, mills	.81
Average cost per ton for freight transportation	$0.68
Total number of registered vessels using canals	886
Total number of passages by unregistered crafts carrying freight	513
Time American canal was operated, days	223
Time Canadian canal was operated, days	241
Total valuation placed on registered vessels	$69,166,400
Total number of passengers transported	37,695
Freight carried by—	
Registered vessels, tons	31,489,497
Unregistered vessels, tons	56,609
American vessels, per cent	94
Canadian vessels, per cent	6
Passengers carried by—	
American vessels, per cent	37
Canadian vessels, per cent	63

COMPARATIVE STATEMENT OF COMMERCE THROUGH THE CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, FOR THE SEASONS OF 1903 AND 1904.

ITEMS	Traffic for 1904		Total traffic for	
	United States Canal	Canadian Canal	Season 1904	Season 1903
VESSEL PASSAGES:				
Steamers, number	8,631	3,557	12,188	14,027
Sailing, number	2,790	204	2,994	3,569
Unregistered, number	732	206	938	1,000
Total number	12,153	3,967	16,120	18,596
LOCKAGES, number	7,293	3,022	10,315	11,642
Tonnage:				
Registered, net	20,160,042	4,204,096	24,364,138	27,736,444
Freight, net tons	26,517,916	5,028,190	31,546,106	34,674,437
Passengers, number	21,606	16,089	37,695	55,175
Coal:				
Hard, net tons	880,417	110,811	991,228	1,149,005
Soft, net tons	4,589,501	874,140	5,463,641	5,788,628
Flour, barrels	2,774,970	1,935,568	4,710,538	7,093,380
Wheat, bushels	20,948,392	20,680,477	49,928,869	61,384,562
Grain, other than wheat, bushels	27,877,579	5,153,413	33,030,992	32,095,646
Manufactured and pig iron, net tons	169,368	60,617	229,985	193,267
Salt, barrels	277,895	87,564	365,459	454,892
Copper, net tons	100,519	9,086	109,605	112,877
Iron ore, net tons	17,207,240	2,428,537	19,635,797	21,654,888
Lumber, M. ft. B. M.	894,324	28,956	923,280	1,003,192
Silver ore, net tons	992	364	1,356	...
Building stone, net tons	25,538	1,555	27,093	21,300
General merchandise, net tons	476,428	255,581	732,009	659,539

The number of registered vessels of 500 to 600 ft. in length using the canal in trade to and from Lake Superior was one; of 400 to 500 ft. in length, 118; of 300 to 400 ft., 182; of 200 to 300 ft., 291; of 100 to 200 ft., 205, and of less than 100 ft. in length, 89. The records show that 477 different vessels in a single trip of each carried, 2,309,405 net tons. The maximum traffic for a single day was on Sept. 6, when 287,399 freight tons passed through the canal on 99 vessels, having an aggregate tonnage of 180,325. The minimum traffic was on May 2, when one vessel registering 27 tons passed through the canals carrying no freight. There were no passages on Dec. 19, 20 and 21. The steamer Augustus B. Wolvin, of the Acme Steamship Co.'s fleet is credited with having moved the largest amount of freight through the canal during the season, 177,729 tons. The largest single cargo, 11,536 tons was carried by the Wolvin. The Wolvin is also credited with the greatest number of mile-tons, 156,410,487. The steamer Huronic of the Northern Navigation Co.'s fleet has the greatest number of miles run to her credit, 33,516.

The following table will prove interesting as showing the distribution to other lakes of freight bound eastward from Lake Superior, and also the district from which freight bound to Lake Superior originated:

East Bound. From Lake Superior Ports to—	Net Tons.
Lake Michigan Ports	2,509,407
Lake Huron Ports	1,044,507
Lake Erie Ports	20,378,202
Lake Ontario Ports	281,720
Total	24,213,902

West Bound. To Lake Superior Ports from—	Net Tons.
Lake Michigan Ports	72,164
Lake Huron Ports	287,980
Lake Erie Ports	6,896,192
Lake Ontario Ports	75,859
Total	7,332,204

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ESTIMATED VALUE OF TOTAL FREIGHT PASSING THE CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, FOR THE SEASON OF 1904.

Items	Quantity	Price per unit	Valuation
Coal, Anthracite, net tons	991,228	$ 5.50	$ 5,451,754
Coal, Bituminous, net tons	5,463,641	2.60	14,205,467
Flour, barrels	4,710,538	5.50	25,907,959
Wheat, bushels	49,928,869	1.05	52,425,314
Grain, other than wheat, bushels	33,030,992	.70	23,121,693
Manufactured Iron, net tons	185,126	100.00	18,512,600
Pig Iron, net tons	44,859	15.00	672,885
Salt, barrels	365,459	.70	255,821
Copper (refined and matte) net tons	109,605	240.00	26,305,200
Iron Ore, net tons	19,635,797	2.65	52,034,862
Lumber, M. ft. B. M	923,280	17.75	16,388,220
Silver Ore, net tons	1,356	55.00	74,580
Building Stone, net tons	27,093	12.00	325,116
General Merchandise, net tons	732,009	135.00	98,821,215
Total			$ 334,502,686

AMOUNT PAID FOR CARRYING FREIGHT THROUGH CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, FOR THE SEASON OF 1904.

Articles	Quantity	Rate per unit	Amount
Coal, net tons	6,454,869	$0.40	$ 2,581,947.60
Flour, barrels	4,710,538	.13	612,369.94
Wheat, bushels	49,928,869	.018	898,719.64
Grain other than wheat, bushels	33,030,992	.018	594,557.86
Manufactured iron, net tons	185,126	2.00	370,252.00
Pig iron, net tons	44,859	1.50	67,288.50
Salt, barrels	365,459	.10	36,545.90
Copper, net tons	109,605	1.45	158,927.25
Iron ore, net tons	19,635,797	.63	12,370,552.11
Lumber, M. ft. B. M	923,280	2.55	2,354,364.00
Silver ore, net tons	1,356	2.00	2,712.00
Building stone, net tons	27,093	1.50	40,639.50
General merchandise, net tons	732,009	2.00	1,464,018.00
Total			$21,552,894.30

In connection with the foregoing table there is also the following summary of relative values of the different commodities passing through the canals:

	Per Cent.
Coal (anthracite and bituminous)	5.88
Cereals (wheat, rye, oats, corn, barley, flax and flour)	30.33
Iron (iron ore, manufactured and pig iron)	21.30
Copper	7.86
Lumber	4.90
All other products	29.73
Total	100.00

TABLE SHOWING TOTAL FREIGHT, ITS VALUATION, FREIGHT CHARGES, AVERAGE HAUL OR DISTANCE FREIGHT WAS CARRIED, AND RATE PER TON PER MILE.

Year	Total Freight Net Tons	Valuation of Freight	Freight Charges	Average Haul	Freight Charges per mile-ton	Value of American Craft	Value of Canadian Craft
				Miles	Mills		
1887	5,494,649	$79,031,757	$ 10,075,153	811 4	2.3	$ 17,084,550	$2,089,400
1888	6,41 1,423	82,156,019	7,883,077	806.4	1.5	20,381,100	1,514,300
1889	7,516,022	83,732,527	8 634.246	790 4	1.5	25,328,600	1,597,600
1890	9,04 1,218	102,214,948	9,472 214	797.2	1.3	27,857,700	1,777,800
1891	8,885,759	128,178,208	9,849.022	820 4	1.35	31,947,900	2,119,500
1892	11,21 1,333	135,117,267	12 072.850	822.4	1.31	36,220,100	2,108,700
1893	10,796,572	145,436,957	9,957,483	831.9	1.1	39,017,400	1,215,700
1894	13,195,860	143,114,502	10,798 310	821.1	.99	41,124,200	1,959,800
1895	15,062,580	159,575,129	14,238,758	830.0	1.14	40,858,800	2,037,000
1896	16,239,061	195,146,842	13,511 615	836.4	.99	43,006,200	2,135,300
1897	18,982,755	218,235,927	13,220 099	841.3	.83	42,375,700	2,001,400
1898	21,234 664	233,069,740	14,125,896	842.6	.79	45,199,800	2 491,900
1899	25 235 810	231,364,750	21,959,707	827.2	1.05	65,000,520	3,369,600
1900	25,643,073	267,041,959	24,953,314	825.9	1.18	66,116,583	3,618,576
1901	28,403,085	289,906,865	23 217,974	823.3	.99	57,244,200	3,811,900
1902	35,961,146	358,306,300	26,566,189	827 4	.89	67,205,000	3,792,400
1903	34,674,437	349,405,014	26,727,785	835.6	.92	68,252,800	6,384,500
1904	31,546,106	334,502,686	21,552,894	843.5	.81	63,789,300	5,377,100

The American canal records show that vessels necessarily spent 17,057 hours and 27 minutes in the canal, or an average of 1 hour, 33 minutes and 55 seconds, which includes time waiting for lockage and passage through locks and canal, the latter being 1 3-5 miles long. Other delays at canal which included taking on supplies, waiting for daylight or favorable weather amounted to 10,917 hours and 45 minutes. Other delays to boats due to operating railway swing bridge amounted to 13 minutes. Trains were delayed 10 hours and 41 minutes by passing boats, temporarily preventing the closing of the bridge.

The American canal post office delivered 120,405 pieces of mail during the season, consisting of 107,104 letters, 5,114 postals, 7,586 newspapers and 601 parcels; also returned 800 pieces to the city post office after being held 30 days uncalled for, and forwarded 2,410 pieces to new addresses. As compared with last year, this shows a decrease of 26,370 pieces of mail.

FASTER AND MORE ECONOMICAL

The performance of the sidewheel steamer City of Buffalo, of the Cleveland & Buffalo line, since she was lengthened 42 ft. at Detroit a little over a year ago have been interesting, not only inasmuch as the operation was a complete success and results have exceeded the predictions of Frank E. Kirby and the hopes of the steamboat line as far as additional capacity is concerned, but operating expenses have been reduced at the same time.

The City of Buffalo was lengthened 42 ft. and at the fullest part of the hull was widened 2 ft. This operation threw out entirely the original plan of the ship, changed the relative location of the paddlewheels, boilers and engines, changed the dip of the wheels, make it necessary to carry the steam from boilers to engine the 42 additional ft., and decreased her draught light, 1 ft. 6 in. The deck space for freight carrying purposes was increased 65 percent, and the passenger accommodations were increased 60 percent.

The steamer, operating under the new conditions, has been in commission a little over a year and ample time has been given to try her out and compile figures of her present performances. General Manager T. F. Newman, of the Cleveland & Buffalo line, has given out the following information: During the season of 1904 the City of Buffalo carried 12,000 tons of freight more than any one previous season, has never been loaded to her former deep load line, has made faster time, is a better sea boat and the fuel consumption has been between six and seven tons less per trip. The contract price for lengthening the boat was $175,000, although more than this amount was spent in new fittings, not included in the shipyard work.

MEAN STAGES OF WATER

The gauge records of the United States Lake Survey show the following mean stages of water above mean sea level for April 1905:

	Stages during April.	Higher Lower than during same month last year.		Higher Lower than during April, 1895.	
	Feet.	Feet.	Feet.	Feet.	Feet.
Lake Superior	602 24	0.07	.....	0 23	.....
Lake Michigan	580.60	0.00	.....	0 63	.....
Lake Huron	580 68	0.05	.....	0 73	.....
Lake Erie	571.81	.....	1.32	0.55	.....
Lake Ontario	245 80	.....	0.83	1.06	.....

Present fall Lake Huron to Lake Erie, 1.37 feet more than year ago.

The four-masted auxiliary schooner which the Kelly-Spear Co. of Bath, Me., are to build, was designed by Mr. W. I. Babcock, Maritime building, New York, and is being built under his superintendence. The owner is Mr. Wm. A. Engenman, of Brooklyn, N. Y., who has very large granite quarries in Maine and Connecticut. The schooner will be used for carrying his own stone. She will be fitted with a small triple-expansion engine and a water-tube boiler and is expected to make about seven miles an hour under steam alone.

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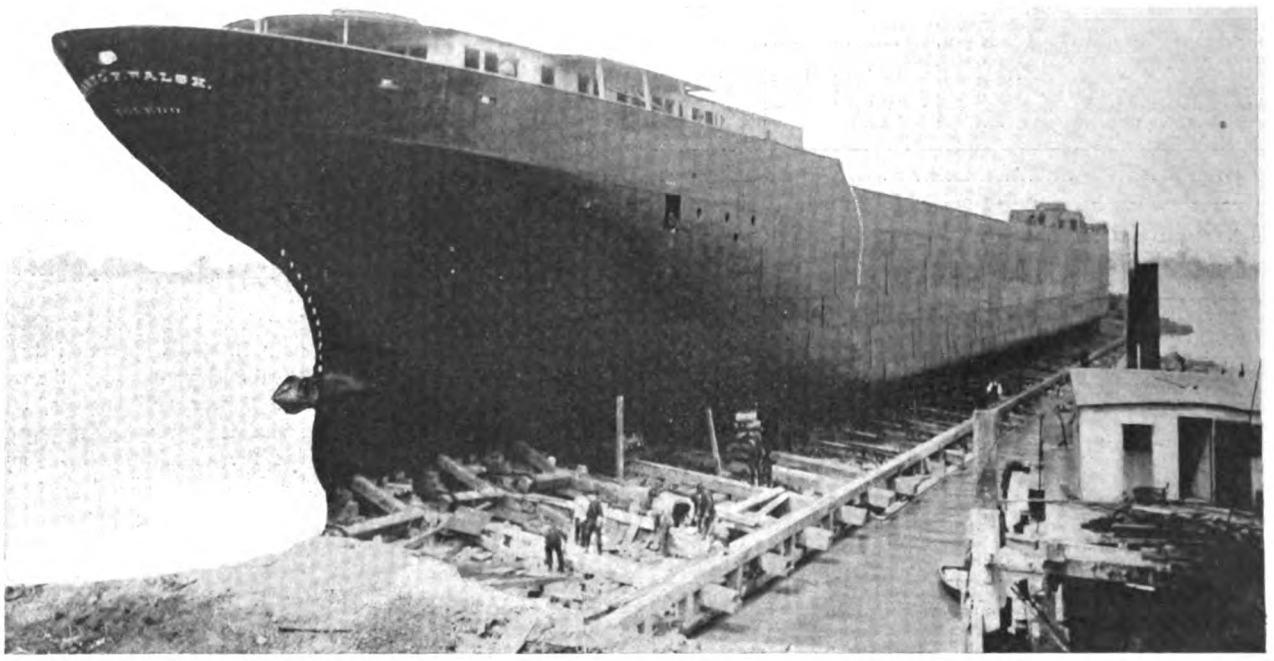
LAUNCH OF THE JAMES P. WALSH

The launch of the freight steamer James P. Walsh, building for Mr. C. O. Jenkins and others of Cleveland at the yard of the Craig Ship Building Co., Toledo, was an eminently satisfactory affair and was the occasion for more genuine enthusiasm than has marked lake launches for some time past. This steamer is the largest that the Craigs have ever built and to accommodate her the launching slip had to be considerably lengthened. She went overboard at 3:30 o'clock Tuesday afternoon with no hitch whatever, and was christened by Miss Florence M. Jenkins, the sister of the managing owner. Later the launching party boarded the steamer and made a complete inspection of the great craft. She is certainly a well constructed boat, extra heavy weight being worked into her. The Walsh is 500 ft. over all, 41 ft. keel, 52 ft. beam and 30 ft. deep and is built upon the girder system of construction, doing away with stanchions or any obstruction that would interfere with the automatic unloading equipment on the docks. Her water bottom is 5 ft. 6 in. deep but the ballast tanks are not carried up the sides as in the case of some of the latter-day steamers. She has twenty-eight hatches spaced 12-ft. centers. Her engines are triple-expansion with cylinders 22½, 36 and 60 in. diameter by 42 in. stroke, supplied with steam from two Scotch boilers 13 ft. 9 in. by 11 ft. 6 in. The keel of the Walsh was laid on Dec. 6 and as the machinery is aboard it will take but a short time to have her ready for business. Mr. George Craig conducted the party aboard the



THE WALSH ON THE STOCKS JUST PRIOR TO THE LAUNCH.

THE WALSH STRUCK THE WATER, BOTH BOW AND STERN AT THE SAME TIME, AS THE PHOTOGRAPH SHOWS.

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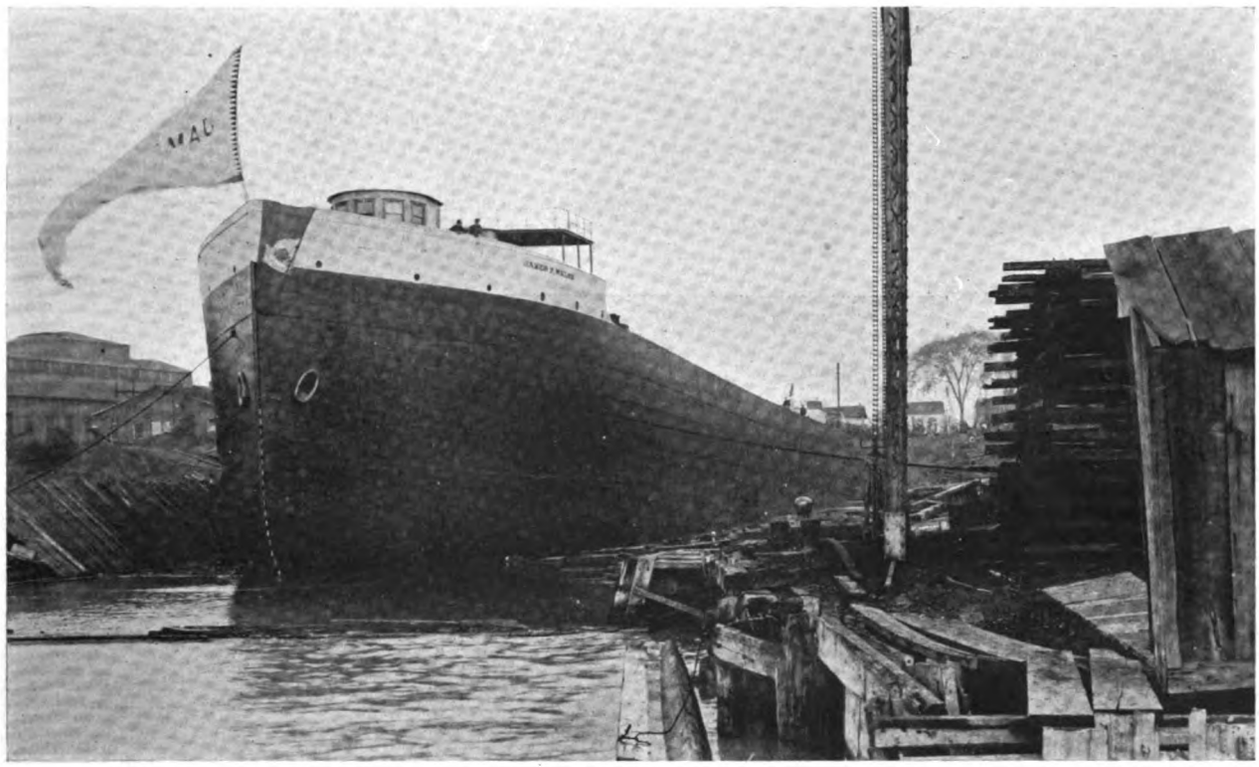

THE WALSH JUST AFTER HER SUCCESSFUL LAUNCH.

steamer and was congratulated upon the record which his yard has made in building this steamer.

Late in the afternoon the launching party repaired to the Toledo Club where dinner was served. The tables were arranged in the shape of a horse-shoe and were beautifully decorated with roses. Owing to the fact that an early train had to be taken for Cleveland the speech-making was necessarily of brief duration. As it was, however, Mr. C. O. Jenkins made the most of his opportunity as toastmaster. He read a number of telegrams from persons who were unable to be present, the list including vessel owners both old and young and many others who are concerned in lake trade. He then proposed a toast to Mr. James P. Walsh, general sales manager of the Pittsburg Coal Co., for whom the boat is named.

In his response Mr. Walsh said that speech-making was not his forte, but nevertheless he spoke well, saying that he had watched the development of great lakes trade from little boats to the great steamers like the Walsh and that he would do what he could to make the Walsh a successful vessel.

Mr. George Sliney of Cleveland made an extremely witty and humorous speech which caused everyone to fairly shriek with laughter. It was so full of puns and plays upon words that it is utterly impossible to reproduce it.

Mr. C. E. Sullivan of Cleveland also spoke quite wittily and hoped that the Walsh would prove a profitable investment. He ended his remarks by proposing a toast to the president of the United States which was drunk standing.

Mr. Walter R. Gilbert said that the launch of the Walsh was a big thing but that a bigger event was the launch of C. O. Jenkins into the vessel business three years ago. He paid quite a tribute to Mr. Jenkins' energy in forming the company to build and operate the Walsh.

Mr. George H. Eichelberger was asked to respond to the toast "The Builders." He did so quite happily, saying that a thing like the Walsh doesn't happen but is gradually approached through years of experience. The Craig company, he said, was not to be measured by what it might do, but by what it had actually done.

In reply Mr. George Craig stated that the company had proved what it could do and hoped that it might have further opportunity to prove it again in the near future.

Mr. Edward Mancourt of Detroit and Mr. J. M. Fitzgerald of New York also spoke briefly commending Mr. Jenkins and the Craigs.

Mr. H. N. Herriman was then called upon for a song but excused himself on the ground that he could not sing without an instrument. This was no way out of it, however, for Mr. Eichelberger in prowling around discovered a piano in an adjoining apartment and had it hauled into the banquet room. The dinner was brought to a close by Mr. Herriman singing "Baffin's Bay."

The launching party were conveyed from Cleveland to Toledo and back in a special car. The party consisted of Mr. and Mrs. James P. Walsh, Mr. C. O. Jenkins, Capt. John Mitchell, Capt. C. L. Hutchinson, John A. Donaldson, H. N. Herriman, Miss Florence M. Jenkins, Miss Louise Bassett, Edward Walsh, Thomas Walsh, Miss Walsh, Mrs. Southern, Mrs. Roger Lee, Miss McCarthy, Miss Schmehl, Mr. Walter R. Gilbert, Mr. H. F. Coates, Mr. and Mrs. Gay Donaldson, Miss Campbell, Mr. Tom Pierce, Mr. George H. Eichelberger, Eugene T. Bush, W. F. Gibbons, Alva Gay, Fred Saal, Mr. and Mrs. C. E. Jenkins, Mr. W. H. Becker, Mr. D. E. Morgan, Mr. P. H. Lavan, Mr. J. M. Buckley, Wm. Beck, W. C. Richardson, N. J. Boylan, C. E. Sullivan, H. K. Coates of Alliance, Mr. H. B. McHugh of Pittsburg, Mr. J. M. Fitzgerald of New York, Mr. H. C. Marshall of Youngstown, Mr. C. P. Grandy of Toledo, Mr. Edward Walsh of Toledo, Mr. C. J. Andrews of Detroit, Mr. Edward Mancourt of Detroit, Mr. L. M. Wing, Coldwater, Mich.; Mr. J. B. Cavanaugh and H. N. Taylor of Chicago. The Walsh will be commanded by Capt. A. J. Greenley.

The steamer Philip Minch on her first trip loaded 8,617 tons of coal for Ft. William and took in 278 tons of fuel at the Ellsworth dock, Cleveland. Some fast work was done in loading. The fast plant dumped 118 cars or 5,775 tons of coal into the new boat in 4 hours, 45 minutes.

Mr. John Craig, president of the Craig Ship Building Co., Toledo, who has been quite ill is reported as slowly recovering.

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From Pittsburg to Tidewater

The movement for the organization of a national waterways association, launched at Cincinnati on Saturday night, May 13, is by far the most important result of the tour of inspection of the Ohio river made by eleven members of the rivers and harbors committee of the lower house. Every member of the committee, before half the trip had been made, was convinced of the necessity of improving this great waterway with a 9-ft. channel throughout its entire length, but the niggardly policy of congress, and some of the past administrations has effectively tied their hands, and unless there is a movement for greater and annual appropriations for this work, it is improbable that the work of canalization will proceed any faster than in the past. With the committee favorable to this great improvement the question of securing some practical means for securing greater appropriations, not only for this work, but for other improvements in every part of this country, was answered by the suggestion of Hon. J. E. Ransdell in and address to the citizens of Cincinnati. Albert Bettinger of Cincinnati, one of the most ardent workers on behalf of Ohio river improvements, seconded the remarks of Congressman Ransdell, and stated that the Ohio Valley Improvement Association will at once take steps for the holding of a national waterways convention, either in New York or Washington, before the end of the year. An association is also to be formed in order that the work can be carried on systematically and intelligently. Congressman Ransdell suggested that the appropriation for rivers and harbors improvements be made a fixed expense of the national government, that the expenditure be no less than $50,000,000 for each bill, and that the appropriation be made every year, instead of spasmodically as is now the case.

HON. T. E. BURTON, CHAIRMAN OF THE COMMITTEE ON RIVERS AND HARBORS.

In an address to the citizens of Parkersburg, Congressman T. E. Burton stated that Ohio river improvements would be carried out in line of their greatest importance and in accordance with the reports of the United States engineers, regardless of the demands of certain local communities who had only their own improvement in mind, and advised that the citizens of the entire Ohio valley get together and agree on some systematic policy of improvement. At Cincinnati he announced that where waterway improvements are largely for the benefit of the locality in which they are made, and do not largely benefit the entire country, at least a portion of the cost of the work should be borne by the community desiring the improvement. He cited the Monongahela river improvements as an example of this kind. At least 65 per cent of the freight originating on this river is delivered to manufacturing plants along its banks and he believes that a portion of the cost of rebuilding locks and dams now proposed be borne by the communities thus benefited.

From an educational standpoint the trip was a marked success. Not only were the members of the committee apprised of the needs of the Ohio valley for this improvement, but they were convinced that the work be completed as speedily as possible. Incidentally they had an opportunity of informing the citizens of this valley that the power of making appropriations for these improvements not alone was vested in this committee. They told of the tremendous difficulties under which they are constantly laboring to secure funds for improvements which they know should be made for the development of the country's commerce, but as long as the people do not instruct their representatives of the necessity and the importance of greater rivers and harbors appropriations, and aid in removing the wrong impressions which so generally prevail throughout the country regarding these appropriations, the work of the committee will continue to be handicapped as it is at present. The plain talk indulged in by Chairman Burton and other members of the committee on this trip has convinced the people of the Ohio valley, and should convince the entire country, that appropriations for rivers and harbors improvements are no longer the "pork barrel" of congress, and that improvements will be made strictly in accordance with their necessity, and the good that will accrue therefrom for the general commerce of the country, regardless of the political influence that some local community can wield in an effort to secure appropriations for work on which the committee has not stamped its approval.

From Pittsburg to Cairo the "Queen City" party was tendered one grand and continuous ovation. The citizens of every hamlet, village and town along the river greeted the passing steamer with salutes, blowing of whistles and ringing of bells, and at many points the members of the town band were hurriedly called to the wharf from their agricultural pursuits to welcome the party. The entertainment was lavish at all points where stops were made. The first stop on the trip was made at East Liverpool, O., where the party was taken from the boat in carriages, escorted by a committee of prominent citizens, for a visit to the largest pottery in the world. Owing to the rain no stop was made at Steubenville,

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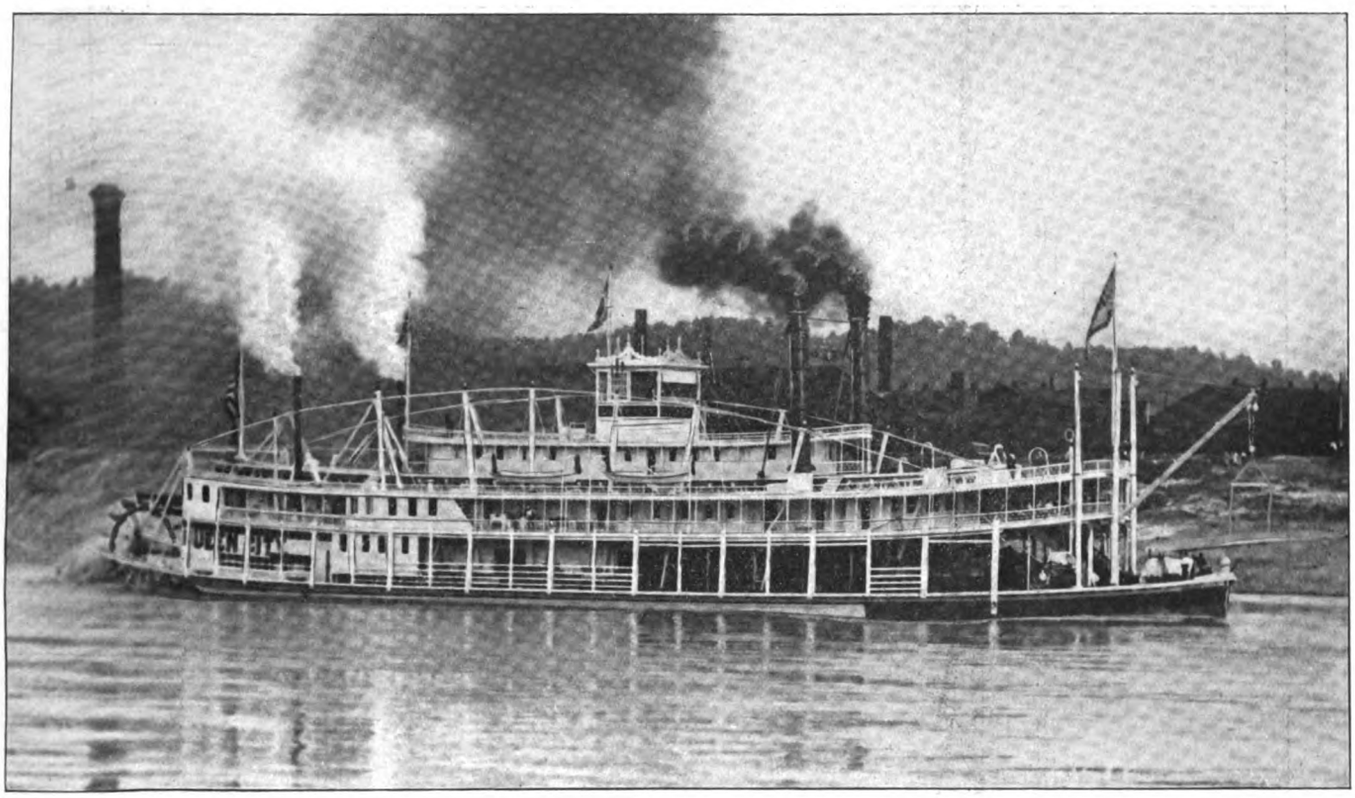
O., but the committee of citizens that boarded the steamer at East Liverpool distributed pamphlets showing the greatness of the tonnage at that point. The towns in the Steubenville district include Steubenville, Toronto, Empire, New Cumberland, Mingo Junction, Brilliant, Wellsburg and Follansbee, and the daily tonnage of all iron and steel products is 13,000 tons; clay products of all kinds 5,200 tons, and the coal tonnage 25,000 tons. With other commodities the total daily tonnage is 44,150 tons or an annual tonnage of 13,245,000 tons, counting 300 days in the year. At Wheeling a reception was tendered and on Thursday night a stop was made at Parkersburg, W. Va. At Marietta, O., the party boarded a local steamer and was taken up the Muskingum for several miles to view this river which has been locked and dammed almost its entire length. At Parkersburg Congressman Burton was the principal speaker. Here he told the citizens of their securing an appropriation for preliminary work on Lock No. 19, amounting to $25,000, although the appropriation as reported from the senate amounted to $300,000. This he said almost caused the entire appropriation bill to fail, as the construction of this lock according to the reports of the engineers was not next in line of importance and for the good of the Ohio system. He also said that the recommendations of the United States engineers called for improvements amounting to over $300,000,000 and that congress only saw fit to appropriate a little more than $30,000,000 to carry on this work. The committee, he added, had tried to give each section its proportionate share of this appropriation and the money is to be expended where it will do the most good. On Friday night an elaborate banquet was tendered the party at Portsmouth, O., and on Saturday afternoon Cincinnati was reached. After a trip through the city in trolley cars a banquet was served in the club house at the "Zoo." It was here that Mr. Burton delivered the most important address of the trip and the earnestness of his remarks coupled with pertinent facts which they contained brought forth applause bordering on an ovation. He said in part:

"Without co-operation but little can be accomplished by the rivers and harbors committee. It seems to me that Cincinnati needs no recommendation in this respect from what we have seen. I am greatly interested in the Ohio, and no great big jolly on my part is needed. What we do want are some practical facts as to how a 9-ft. stage can be secured. What steps are necessary to secure it is a leading thought. The first is that the benefits of such an improvement shall be commensurate with the expenditure and not alone in the imagination of the enthusiastic supporter. Secondly, the policy of the country must be liberal enough to provide the means whereby the improvements can be accomplished.

"I have spoken in nearly all the large cities of the country and am surprised at the misapprehensions that prevail. There are some communities which believe that all that is necessary is to secure our ear, and then we will open up the gates of the government treasury to supply their wants. This is surely a misapprehension. While congress appropriates $100,000,000 for a navy and equally large amounts for the army, post office, pensions, etc., rivers and harbors appropriations do not exceed from $25,000,000 to $30,000,000. They are made grudgingly and the executive department seems to think that whenever retrenchment is in order the rivers and harbors bill is the first to strike at. One bill was vetoed by President Cleveland, another was talked to death in the senate and there is opposition to all of them. The reason for this misapprehension is the idea that these improvements do not benefit the whole country. It is necessary to educate the people to this fact. Why, in 1902 I demonstrated that the rivers and harbors bill as submitted contained appropriations for creeks and streams of only 1-150th part of the whole bill. Yet this chatter of appropriations for important waterways you cannot down. It springs up, and the cry is raised that we are expending sums of money on small streams and this militates against the appropriation. The only way in which to stop this is to kill off some of the ignorant writers on this subject. Right here is an instance of such work which I shall read. It is taken from a publication in a special line, the paragraph I refer to being as follows: 'Among those who keep in touch with rivers



THE STEAMER QUEEN CITY UPON WHICH THE RIVERS AND HARBORS COMMITTEE MADE THE TOUR.

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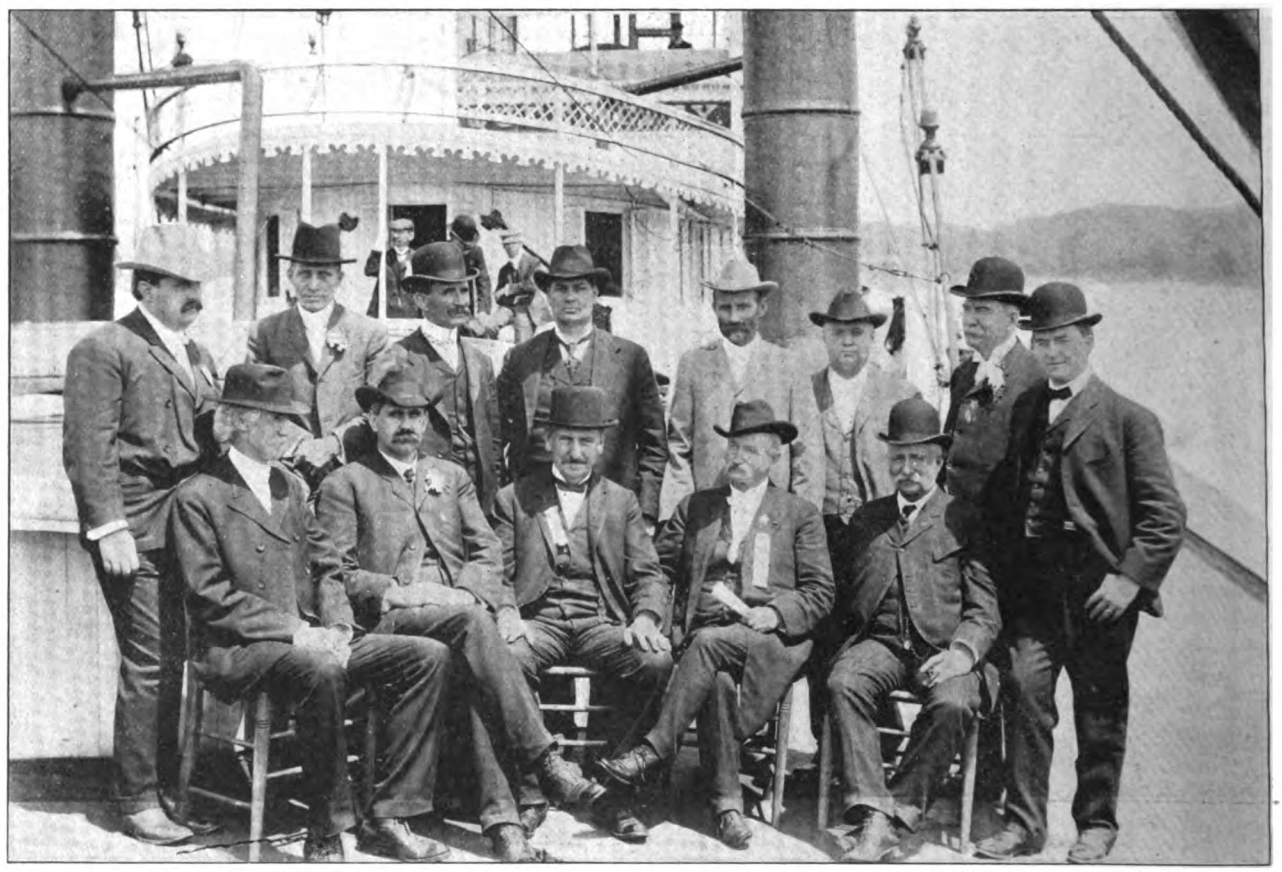
and harbors appropriations it is well known that these appropriations are not made in the right spirit; that the welfare of the country is not considered but rather that they serve as a sort of balm for certain sections politically.'

"If the charge were made in the house of representatives we would attribute it to ignorance. The rivers and harbors committee does not need any defense. We are not going to lower the standard. Since I have been on the committee efforts to amend our bill have been made three hundred times, but never once were they successful, a record which stands without parallel. Does that not seem that they were made in the right spirit, without log rolling or dishonest motives?

"Another statement which attracted my attention was the sentence addressed to this committee 'do your duty.' One-fourteenth of that last rivers and harbors appropriation, amounting to $2,400,000, went to the Ohio river. I would ask that no inaccuracies be allowed to creep into statistics which bear your approval. These remarks are not intended for those who are gathered here tonight, but it is a sample of the work which is doing harm to the improvement plans of your river.

"The task of the committee is necessarily one of elimination. It is impossible to provide for all and we must omit considerable. Let your advocacy be along these lines. I believe in building the trunk line first and the branch afterward. Concentrate on the principle first and the details later. Improve the main body of the Ohio before its tributaries. There is in congress an appropriation of $4,500,000 for the improvement of the Big Sandy river, and every year amendments are made in efforts to force it through. Yet it is conceded that these improvements will not be of practicable benefit before the dam is built in the Ohio a little below the mouth of the river. And we are asked to turn aside from the Ohio, which is not logical nor business like. There are along the Big Sandy extensive coal lands which at present are worth about $5 an acre. If the improvement in the river is made it will make these lands worth from $50 to $100 an acre. It is not more coal that is needed in this country, but improved methods of transportation. There are hundreds of millions of tons of coal in this country and we can well afford to conserve these virgin fields for a while longer.

"There is another river about which I desire to make a few remarks. That is the Monongahela. Some years ago the government bought the locks and dams in that river owned by a private corporation for approximately $3,750,000, and since that time millions have been spent in renewing and repairing them. Statistics show that more than 65 per cent of the products shipped on its course is delivered at points above Pittsburg or at that point. The improvement is therefore essentially local in character. Through these improvements property values in that locality have been multiplied again and again and I believe that communities thus benefited should bear a portion of the expense of the improvements. It is not fair to ask the people who are not directly benefited to pay in full for improvements which are of such local character and I speak of the Big Sandy in the same strain."



THE RIVERS AND HARBORS COMMITTEE ON THE STEAMER QUEEN CITY.

STANDING—READING FROM LEFT TO RIGHT: WILLIAM LORIMER, CHICAGO, J. ADAM BEDE, JAMES McLACHLIN, WESLEY L. JONES, JOSEPH E. RANSDELL, STEPHEN M. SPARKMAN, DE ALVA S. ALEXANDER, J. H. CASSIDY, SECRETARY.

SITTING—READING FROM LEFT TO RIGHT: E. F. ACHESON, JAMES H. DAVIDSON, THEODORE E. BURTON, BLACKBURN B. DOVENER, ROSWELL P. BISHOP.

Hon. Joseph E. Ransdell said that it is pitiful that such small sums are set aside for rivers and harbors improvements, when there is expended manifold times these amounts for other matters that do not add nearly so much to the prestige of the country. Transportation by rail he said is from three to four times as costly as by water and the development of the great waterways will materially solve the present railroad rate problems. He then suggested the education of the people on this important subject by the organization of a national waterways association and the holding of a convention to demand no less than $50,000,000 annually for rivers and harbors improvements.

On Sunday morning Congressman Burton left the party at

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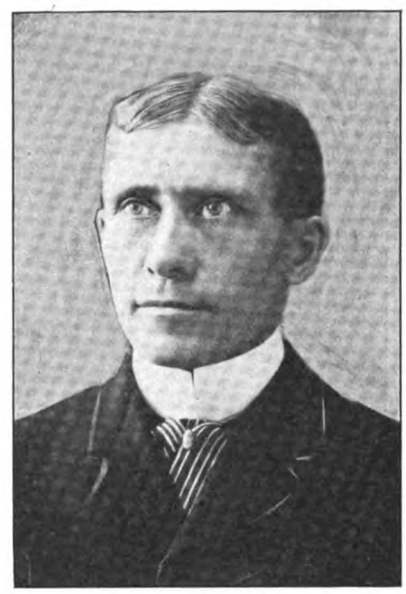
Cincinnati owing to pressing business matters and Hon. B. B. Dovener headed the party in his absence. Stops were made at Louisville Monday, May 15, Evansville, Ind., Tuesday, and the trip ended at Cairo on Wednesday night. Most of the party remained on the steamer and returned to Cincinnati where they left for their homes.

STEPHEN M. SPARKMAN.

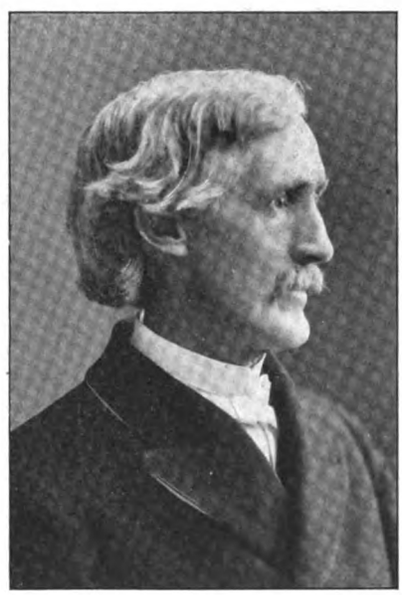
JAMES HENRY DAVIDSON.



J. ADAM BEDE.

The appointment of the board of army engineers to determine the cost and advisability of canalizing the Ohio to a depth of 9 ft. was welcome news to the entire party. Three of the men on the board are now located on the Ohio and have charge of work now being done. The board members are: Lieut. Col. D. F. Lockwood, Washington, president; Lieut. Col. E. B. Ruffner, Cincinnati; Lieut. Col. C. B. Sears, New Orleans; Maj. Geo. A. Zinn, Wheeling; and Maj. W. L. Sibert, Pittsburg.

ROSWELL P. BISHOP.



ERNEST FRANCIS ACHESON.

BLACKBURN B. DOVENER.

The members of the rivers and harbors committee expressed themselves as follows on Ohio river improvements:

T. E. Burton.—This trip will be of great value in giving a clearer idea of the resources of the Ohio valley and the possibilities of development to be gained by improved facilities for transportation. There is another advantage, which I trust, will result from the trip, namely, the education of the people upon river and harbor appropriations. No branch of government expenses is so little understood. There seems to be a prevalent impression that all that is required to obtain money for needed improvements is to make an earnest push and then the money will be forthcoming from the federal treasury. The fact is that no appropriations are made more grudgingly, and this handicap embarrasses the committee as well as all other friends of waterways.

S. M. Sparkman.—I expected to see big things on my trip through this valley and my expectations have been more than realized. I knew that it was a great industrial center, teeming with manufacturing plants of all kinds. The river is certainly worthy of improvement, and the trip will be beneficial to the rivers and harbors committee, inasmuch as they have an opportunity of becoming better acquainted with the needs of the valley and the wishes of the people. The improvement of the river proposed to a permanent six or nine foot stage is a great project, undoubtedly the greatest one of internal improvement undertaken in this country. Of course it is not to be compared with the construction of a Panama canal, yet its

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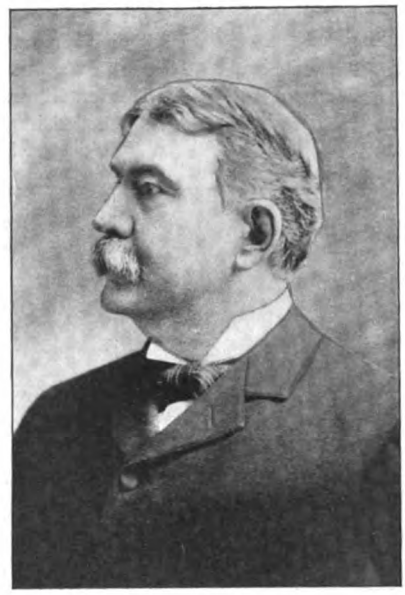
JOSEPH EUGENE RANSDELL.



DR. ALVA STANWOOD ALEXANDER.

WESLEY L. JONES.

magnitude should not be underestimated. We now have seen the importance of this work.

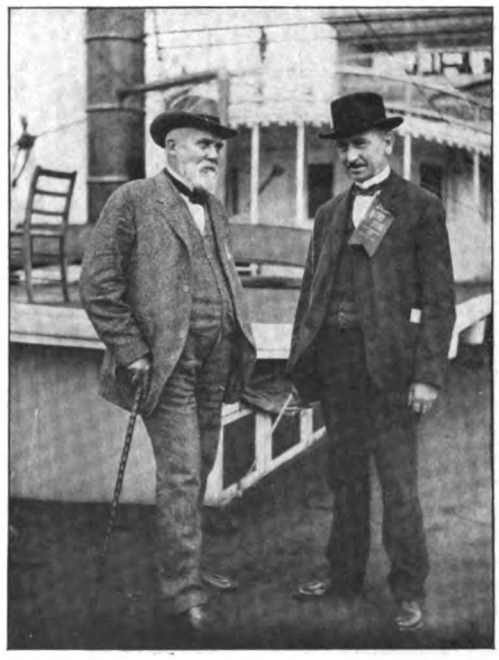
J. Adam Bede.—The question of a permanent navigable stage for the Ohio river is largely one of getting all the people to favor the project, not of convincing the committee. We are convinced. If we are going to lock and dam this river its entire length, I believe a nine-foot channel should be provided. That would allow all vessels to navigate the entire year. It will mean the development of an up-river trade and the down traffic you already have. But the people and newspapers of the Ohio valley must arouse the interest of the people elsewhere. Impress upon the public the possibilities of this up-stream traffic. It has been the strongest opponent of this improvement.

William Lorimer.—I think, as the remaining members of the committee think, that this improvement should be made, and the sooner it is carried out the better. It can be made as soon as the people of the Ohio valley get the support of other committees for it. This trip has been an excellent one from an educational point of view, and it has called the attention of other committees to this great Ohio valley. Such improvements are beneficial to the entire country, no matter where made. By improving the waterways we are doing what, to my mind, is most beneficial and effective in reducing transportation charges.

R. P. Bishop.—The entire Ohio valley is one great workshop, and is without doubt one of the greatest valleys in the world. I believe it is the duty of the government, at as early a time as practicable, and in the interest of all our people, to make this necessary improvement. While we recognize the importance of the improvement asked for, there are many other great projects which demand attention. Every great project is a matter of growth, and where immense possibilities are at stake, immense sums are demanded. The work, even if there was plenty of money, would be slow. But the demands being so great upon the government for all projects and appropriations, the work must be necessarily slow. It is the general policy of the government to aid and foster wherever it can do so.

Ernest F. Acheson.—The value of river improvement is

CAPT. JOHN F. DRAVO, HALE AND HEARTY AT EIGHTY-SEVEN.



COL. JOHN L. VANCE AND HON. T. E. BURTON.

CAPT. TOM REES AND J. F. ELLISON.

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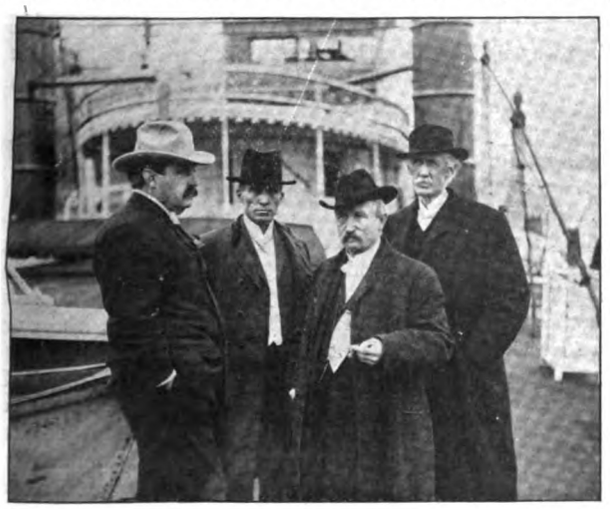
shown by the great Pittsburg district. Its development was largely due to the maintenance of a great river that is navigable the entire year. There are many great cities and industrial communities along the Ohio, and there will be many more when a nine-foot stage is secured. The one great need now is to arouse public sentiment in favor of this improvement. With that accomplished, all is accomplished, for this committee is earnest in its work and would like to do that which it knows is best for all. But public sentiment must force the great appropriations.

CAPTAINS W. B. RODGERS AND J. A. HENDERSON, AND MR. JOHN H. JONES, ALL OF PITTSBURG.

J. H. Davidson.—This valley is already one great hive of manufacturing plants, and a permanent navigable stage of water is now needed for its further development. I am an advocate of river improvements, but before anything can be done an estimate of the difference in cost of a six-foot and nine-foot channel must first be secured. The tendency of the times with railroads is to concentrate until the day of railroad



CONGRESSMEN LORIMER, BEDE, DOVENER AND ACHESON.

competition is past. The waterways are the only means of traffic that can insure continued competition. I do not measure the value of a waterway from the tonnage it carries, but if it tends to hold down the freight charges it is of great value and tremendous benefit. The people will demand this improvement of waterways, this competition which is the best weapon against the evil of high and discriminating freight rates.

LADIES OF THE PARTY, WITH MRS. JAMES A. HENDERSON IN THE CENTER.

J. E. Ransdell.—No man takes a deeper interest in the welfare of the Ohio river than I do. I am heartily in favor of the contemplated improvement, indeed every member of the committee is. In the past all agitation for improved waterways has been entirely too local. The people should extend this agitation, so that there will be a systematic and harmonious demand for this improvement all over the country. The government has been niggardly in its policy for the improvement of internal waterways, and until it pursues a different policy, the rivers and harbors committee will have a hard time getting the money for the much needed improvement of the Ohio

B. B. Dovener.—Ever since I have been a member of Congress and one of this committee, I have always advocated the improvement of the Ohio. This valley is already one great workshop, and with a continuous nine-foot stage the possibilities of further growth cannot be imagined. There is no doubt in the minds of the members of the committee that this improvement should be made, but unless the appropriations for rivers and harbors improvement are very materially increased in the future, it will be a long time before this improvement can be carried out.

De Alva S. Alexander.—Twenty-five years from now, when the improvements on the Ohio now agitated are completed, we will look back and wonder that there ever was any necessity of a rivers and harbors committee making this trip. The commerce on the river already exists and what is required are the best facilities obtainable for fostering this traffic. The great enthusiasm of all the people along this great valley is almost pathetic. The improvement now desired should have been undertaken years ago. The rivers and harbors committee, however, requires the support of all the people of this country in order that increased appropriations can be secured for rivers and harbors.

Wesley L. Jones.—Regardless of the fact that we are convinced that this great improvement should be made, we are powerless unless the people demand an annual appropriation for rivers and harbors commensurate with our commercial growth. The present appropriations are entirely inadequate to carry out the work and improvements that require attention. With engineers' estimates calling for improvements amounting to over three hundred million dollars and a little more than thirty millions appropriated it can readily be seen how slow the most pressing improvements must necessarily be. Our government should make an appropriation every

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year for this great work which has only in view the upbuilding of our commerce.

The "Queen City" party was composed as follows:

Hon. T. E. Burton, chairman rivers and harbors committee, Cleveland.
Hon. B. B. Dovener, Wheeling, W. Va.
Hon. R. P. Bishop, Ludington, Mich.
Hon. E. F. Acheson and wife, Washington, Pa.
Hon. D. S. Alexander, Buffalo, N. Y.
Hon. J. H. Davidson, Oshkosh, Wis.
Hon. Jas. McLachlan and wife, Pasadena, Cal.
Hon. William Lorimer and daughter, Chicago.
Hon. Wesley L. Jones, N. Yakima, Wash.
Hon. Jos. E. Ransdell, Lake Providence, La.
Hon. J. Adam Bede, Pine City, Minn.
Hon. S. M. Sparkman and son, Tampa, Fla.
J. H. Cassidy and wife, secretary rivers and harbors committee, Cleveland.
J. H. McGaun, assistant clerk rivers and harbors committee, Cleveland.
E. F. Hutchinson, stenographer rivers and harbors committee, Cleveland.
Col. John L. Vance, president Ohio Valley Improvement Association, Columbus.
Capt. J. F. Ellison, secretary and treasurer Ohio Valley Improvement Association, Cincinnati.
Capt. J. A. Henderson and wife, Pittsburg and Cincinnati Packet Line, Pittsburg.
Capt. W. B. Rodgers, Rodgers Sand Co., Pittsburg.
Capt. J. F. Dravo, "Dean of Inland River Navigation," Pittsburg.
F. W. Treadway, Cleveland.
Col. E. H. Ruffner, Cincinnati.
Maj. W. L. Sibert, Pittsburg.
Maj. G. A. Zinn, Wheeling, W. Va.
Capt. H. Burgess, Louisville.
Hon. H. K. Porter, H. K. Porter Locomotive Co., Pittsburg.
Col. Geo. H. Anderson, wife and daughter, manager Chamber of Commerce, Pittsburg.
J. W. Wardrop and wife, secretary Merchants' and Manufacturers' Association, Pittsburg.
B. B. Naylor, secretary Wheeling Board of Trade, Wheeling, W. Va.
John Waterhouse, president Wheeling Board of Trade, Wheeling, W. Va.
A. J. Stone, Fairmont, W. Va.
E. J. Lloyd and wife, president Merchants' and Manufacturers' Association, Pittsburg.
John H. Jones, president Pittsburg-Buffalo Co., Pittsburg.
E. A. Smith, Cairo, Ill.
John M. Williams, general agent Ohio Valley Improvement Association, Cincinnati.
Capt. Warren Elsy, master transportation, Jones & Laughlin Steel Co., Pittsburg.
Capt. T. Rees, James Rees & Sons Co., Pittsburg.
D. J. Sinclair, vice president Ohio Valley Improvement Association, Steubenville, O.

MAIDEN TRIP OF THE JUNIATA

The Juniata of the Anchor Line under command of Capt. Edward Martin, left Cleveland at 7:30 o'clock Sunday morning last on her maiden trip to Chicago. She carried neither freight nor passengers but had a few guests aboard as far as Detroit. An hour or more was spent in adjusting compasses under the direction of Mr. Frank Morrison, and then the steamer was headed for Detroit. No attempt was made to push her, the early part of the trip being made in a leisurely manner, but by the time the islands were reached the quadruple-expansion engines had worked up to 100 revolutions per minute and the Juniata had quite a bow wave. A finer day could not have been selected for a trip; nor is it likely that there is a more complete or more comfortable ship on the lakes. She rides easily and notwithstanding the fact that she was light the guests while seated at dinner were unable to discover any perceptible motion to the steamer, so smoothly did she run. It is an unfair statement to make that the Juniata is a better ship than the Tionesta, for the experience gained in constructing the Tionesta has been profitably used in building the Juniata. Therefore, while the ships are virtually duplicates the Juniata is the more complete because there are embodied in her certain details that are lacking in the sister ship. The Juniata is a revelation in a way of little mechanical contrivances for saving labor, and Mr. Frank E. Kirby, who is an enthusiast along mechanical lines, whether of ship design or not, took great delight in pointing out various little features of excellence to the guests. Wherever human labor can be saved on the Juniata it has been saved, even to the installation of dish washing machines and egg boilers. The galley of this steamer is certainly such as would delight the heart of any woman. It is nearly the whole width of the ship and is abundantly lighted, since its main light is derived from the sky and the fumes of cooking are drawn by the McCreary system of ventilation directly into the stack of the steamer. A splendid feature of this steamer and her sister, the Tionesta, is that the galley is aft of the passenger sleeping quarters, so that by no possibility can the odors of cooking penetrate there. Moreover the dining room, immediately forward of the galley, is on the promenade deck, affording an unobstructed view out doors to every passenger, both port and starboard. The dining room is decorated in mahogany and is of spacious dimensions. The completeness of mechanical devices, even to the smallest detail, is also to be noted even in the dining room. The dining room chairs, while they swing to all points of the compass, are naturally upon stationary bases and are placed at a distance from the table convenient to most persons. However, a certain number of chairs, while no larger than the rest have been designed to accommodate even the extraordinarily corpulent person who sometimes resolves to travel. These chairs are placed at the outer side edge of the table where there is abundant aisle room for maneuvering and are upon a sliding base which can be adjusted at any point desired. The dining room is strikingly decorated by some excellent mural paintings depicting Indian scenes.

In outward appearance the Juniata differs from the Tionesta in that she has eight additional suites upon the hurricane deck and that her deadlights are round instead of square. The Juniata is designed as a passenger and package freighter, but unlike the common package freighter, she will not carry grain. She is 361 ft. over all, 340 ft. keel, 45 ft. beam and 28 ft. deep, and is equipped with quadruple-expansion engines 22, 31½, 45 and 65 in. cylinder diameters by 42 in. stroke, supplied with steam from four Scotch boilers 12 ft. 6 in. by 11 ft. 6 in., equipped with Howden forced draft and allowed a pressure of 210 lbs. This is also the machinery equipment of the Tionesta but the Juniata's boiler room is 2 ft. longer.

Singularly enough the only craft to salute the Juniata in the trip across Lake Erie was the package freighter New York of the Erie line, but she was given a continuous reception on her way up the Detroit river, so much so that she had to acknowledge with her hoarse whistle the welcome of persons on the lawns of Amherstburg.

When the Juniata arrived at the Anchor Line dock at Detroit she found the Tionesta there, the sistership having left Cleveland on Saturday night. Capt. Doherty of the Tionesta who, with his entire crew, had been promoted from the Japan, signalled that he would leave the dock in five minutes and the Juniata accordingly decided to lie alongside of her instead of making the dock below. In this way it was possible to get pictures showing the sister ships lying together, a circumstance which will probably not occur again during the entire season. The guests left the Juniata at Detroit; Mr. J. C. Evans, the western manager, and Mr. C. J. Fox, the chief engineer of the line, continued on to Chicago. The party to Detroit included Mr. and Mrs. Frank E. Kirby, Capt. and Mrs. James Stone of Cleveland, W. S. Main of Pittsburg, Mr. and Mrs. R. S. Hart of Cleveland, P. E. Bourke of Detroit, Mr. John Marron of Cleveland, Mr. M. J. Doyle of Cleveland, Mr. and Mrs. J. C. Evans and Miss Kittredge of Buffalo.

At a meeting of the directors of the Great Lakes Towing Co. this week the regular quarterly dividend of 1¾ per cent. payable July 1, was declared.

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THE JUNIATA'S MAIDEN TRIP AND HER GUESTS ABOARD.

THE JUNIATA AND TIONESTA TOGETHER AT DETROIT; MR. FRAMK E. KIRBY; CAPT. EDWARD MARTIN. J. C. EVANS AND CAPT. JAMES STONE DISCUSSING PASSING SIGNALS; MR. P. E. BOURKE, MR. C. J FOX AND CAPT. JAMES STONE; THE GUESTS GROUPED FOR THEIR PICTURE; MR. J. C. EVANS AND FRANK E. KIRBY. MR. FRANK MORRISON ADJUSTING THE COMPASS; THE JUNIATA IN THE DETROIT RIVER; MR. M. J. DOYLE.

ANCHOR LINE'S NEW OFFICE

The Erie & Western Transportation Co., Anchor Line, now that they have a fleet of modern up-to-date "American-plan" steamers, has made another move in keeping with the progressive policy of the present management, and established an up-town office at No. 112 Euclid avenue, Colonial Arcade, where Mr. M. J. Doyle, city ticket agent of the Pennsylvania Co., will have charge of the local passenger department. All bookings will be made from this office, and on sailing dates Mr. Doyle will be at the dock office, foot of Water street, after 7 P. M., to look after the interests of the patrons of the line.

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CAPACITIES OF ORE SHIPPING DOCKS

Mr. Robert Angst, chief engineer of the Duluth & Iron Range road has compiled the statistics of the capacities of the iron ore docks at the head of the lakes and has tabulated them in the convenient form of a blue print. During the year there have been 272 ore pockets added to the docks at the head of the lakes and the Gladstone dock has passed out of existence. The improvements have been to dock No. 3 of the Missabe system in Duluth, and to dock No. 3 of the Iron Range system at Two Harbors. There were added during the year 192 pockets to the Duluth dock and eighty to the Two Harbors structure. The largest individual dock is Great Northern No. 2 at Superior. Its storage capacity is 87,500 tons. The smallest individual ore shipping dock is the one owned by the Algoma Central & Hudson Bay road at Michipicoten. It has but twelve pockets. The largest ore dock system is that of the Duluth, Missabe and Northern in Duluth. It has 1,050 pockets and the total storage capacity is 207,360 tons. The total length of the ore shipping docks of the lake region is 35,287 ft., and if placed end to end they would make a single ore dock more than 6½ miles in length.

RECORD OF ORE DOCKS ON THE GREAT LAKES

RAILWAY	LOCATION	DOCK NO	NUMBER OF POCKETS	STORAGE CAPACITY TONS	HEIGHT WATER TO CENTER HINGE HOLE	HEIGHT WATER TO DECK OF DOCK	WIDTH OF DOCK OUTSIDE TO OUTSIDE OF PART'N POSTS	LENGTH OF SPOUTS	LENGTH OF DOCK	ANGLE OF POCKETS
Chicago & North Western Ry	Escanaba, Mich.	1	184	24104	28'-10"	48'-6"	37'-0"	21'-0"	1104'	39°-30'
" "	"	3	226	30284	31'- 2"	52'-8"	37'-0"	27'-0"	1356'	45°- 0'
" "	"	4	250	32750	36'- 6"	59'-2"	37'-0"	30'-0"	1500'	45°- 0'
" "	"	5	282	43152	28'- 6"	53'-3"	37'-0"	21'-8"	1392'	40°- 0'
" "	"	6	320	58000	40'- 0"	70'-0"	50'-2"	30'-0"	1920'	45°- 0'
" "	Ashland, Wis.	1	234	42120	40'- 0"	70'-0"	48'-0"	30'-0"	1404'	45°- 0'
" "	"	2	234	25740	36'- 6"	57'-8"	46'-0"	27'-0"	1404'	42°- 0'
Duluth & Iron Range Rail Road.	Two Harbors, Minn.	1	202	40400	35'- 5"	59'-6"	49'-0"	27'-0"	138	38°-42'
" "	"	2	208	41600	33'- 5"	57'-6"	49'-0"	27'-0"	1280'	38°-42'
" "	"	3	170	34000	40'- 0"	66'-0"	49'-0"	27'-0"	1054'	43°-32'
" "	"	4	168	36960	37'- 0"	62'-0"	49'-0"	29'-0"	1042'	38°-42'
" "	"	5	168	33600	30'- 0"	54'-6"	49'-0"	25'-0"	1042'	38°-42'
Duluth Missabe & Northern Ry.	Duluth, Minn.	1	384	57600	30'- 0"	53'-0"	49'-0"	27'-9"	2336'	45°- 0'
" "	"	2	384	69120	32'- 0"	57'-6"	49'-0"	27'-9"	2336'	45°- 0'
" "	"	3	384	80640	40'- 7"	67'-½"	59'-0"	27'-9"	2304'	45°- 0'
Great Northern Ry.	Superior, Wis.	1	250	40500	32'- 9"	57'-0"	49'-0"	27'-3"	1525'	45°- 0'
"	"	2	350	87500	40'- 0"	72'-8"	62'-8"	32'-4"	2100'	45°- 0'
"	"	3	160	40000	40'- 0"	72'-8"	62'-8"	32'-4"	960'	45°- 0'
Duluth, South Shore & Atlantic Ry.	Marquette, Mich.	1	270	27000	25'- 0"	45'-0"	40'-0"	20'-4"	1700'	39°- 0'
" "	"	4	200	28000	27'- 9"	47'-3"	36'-8"	21'-1"	1200'	39°-45'
Lake Superior & Ishpeming Ry.	Marquette, Mich.	1	200	36000	30'- 9"	54'-0"	50'-0"	24'-7"	1232'	38°-40'
Wisconsin Central Ry.	Ashland, Wis.	1	314	48356	40'- 0"	66'-2"	36'-0"	27'-0"	1908'	50°-45'
Chicago, Milwaukee & St. Paul Ry.	Escanaba, Mich.	1	240	50400	40'-2¾"	66'-6"	52'-0"	120-27'-0" 120-29'-0"	1500'	45°- 0'
Algoma Central & Hudson Bay Ry.	Michipicoten, Ont.	1	12		34'- 0"	43'-4"	25'-0"	22'-6"	311'-9"	44°- 0'

ELECTRIC POWER FOR ERIE CANAL

Although the completion of the 1,000-ton barge canal across New York state is five, and possibly six years away, contracts for only the most difficult sections having been closed, the interest of lake men has been aroused as to the means of propulsion to be used on the new waterway. The speed of boats on the canal will, of necessity, be limited on account of the narrow confines and large traffic expected. Anything above a very low speed would cause constant washes on the banks and the construction of the vessels, blunt and full, will give them a large displacement.

One of the best informed marine men of Buffalo, and one who has done a great deal to further the canal plans, speaking of the power to be used to take boats through after the new waterway is completed said:

"I do not think there will be many boats propelled by steam, self contained, on the new canal. My opinion is that electric power will be used, and from what I learn of experiments being made it will be of the trolley system at the side of the canal instead of mules or horses. Electrical operation is economical, not elaborate, and is effective. The completion of the 1,000-ton barge canal across the state will mean much to the lake men as it is an extension of the cheap transportation facilities of the lakes to the coast and will not admit of coast vessels entering into competition as their vessels, or large lake vessels either, with their high operating expenses and high-priced crews, to make the slow, tedious trip through the canal, in competition with large carrying, cheaply constructed, and inexpensively operated canal barges drawn by electric motors."

CLASS-BOOK OF NAVAL ARCHITECTURE

Mr. W. J. Lovett, lecturer on naval architecture at the Belfast Municipal Technical Institute, has written a complete class-book of naval architecture with numerous illustrations and almost 200 fully worked-out answers to recent Board of Education examination questions. In his introduction the author states that while the science of ship building is perhaps the most vital science, its literature is of the scantiest. This want is nowhere more keenly felt than with the vast body of students attending technical classes, who have absolutely no work on naval architecture that will carry them through their courses of study. There are excellent manuals, of course, but their application to technical students is limited and their price is prohibitive to most. This book is designed for shipwrights, platers, draughtsmen and others who desire a book at a reasonable price which will supply them with a sufficiency of naval architecture for their ordinary and everyday needs and enable them afterwards to study those higher works on the subject with intelligence and profit. The price of the work is $2.50 and is for sale by the Marine Review.

The freight steamer Onondaga building for the East Caicos Co. of Turk's island, West Indies, was launched recently at Cramp's, Philadelphia. The sponsor was Miss Emily Cramp Taylor, daughter of Mr. Charles T. Taylor, secretary of the Cramp Co. The Onondaga is a sister ship of the Chippewa which was launched some time ago at Cramp's. She is of the three deck type, 283 ft. long, 40 ft. beam and 21 ft. deep. She has triple-expansion engines and a Scotch boiler.

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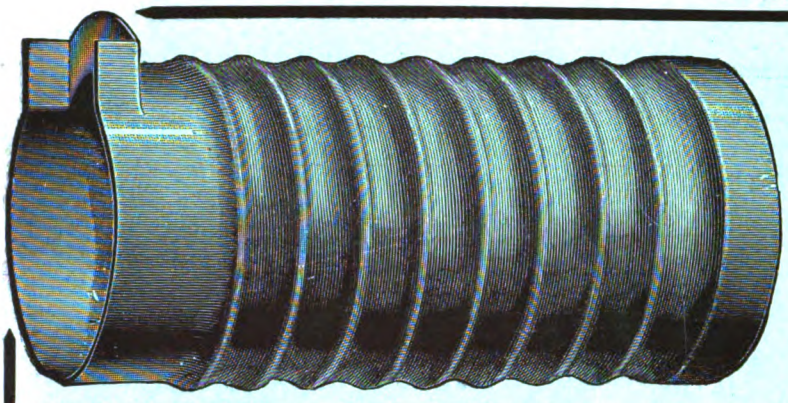

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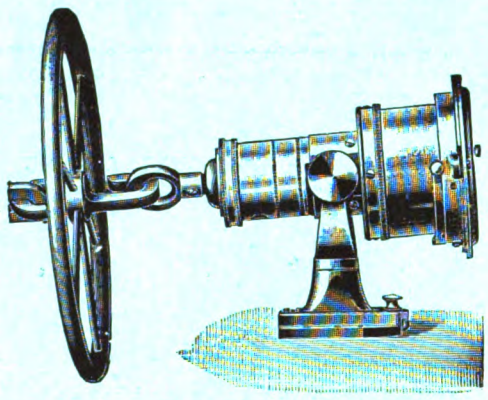

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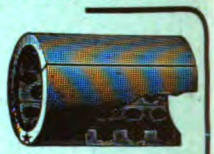

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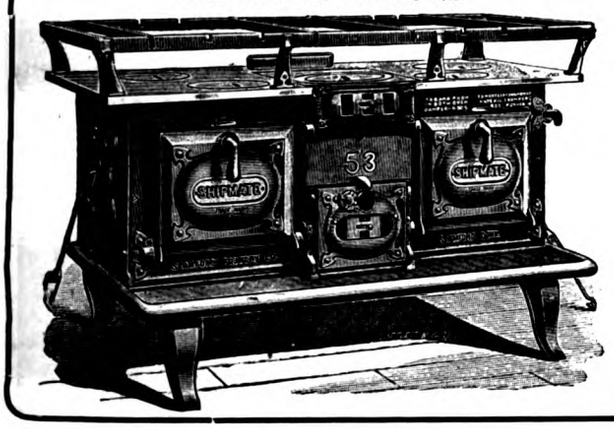

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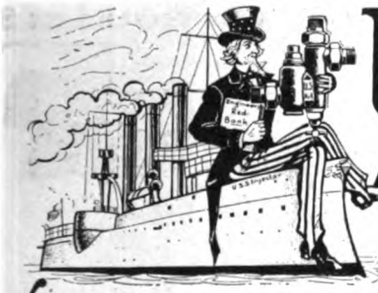

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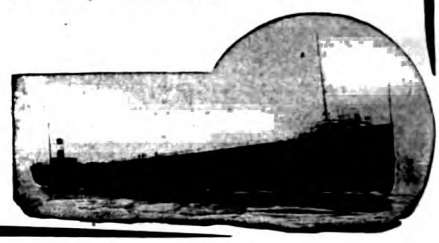

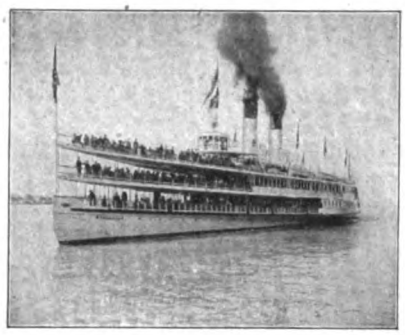

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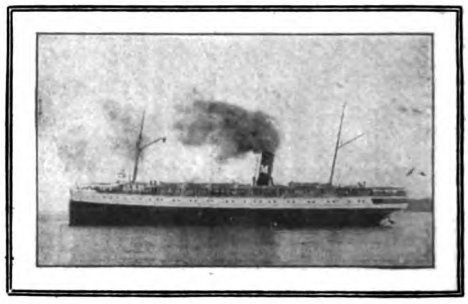

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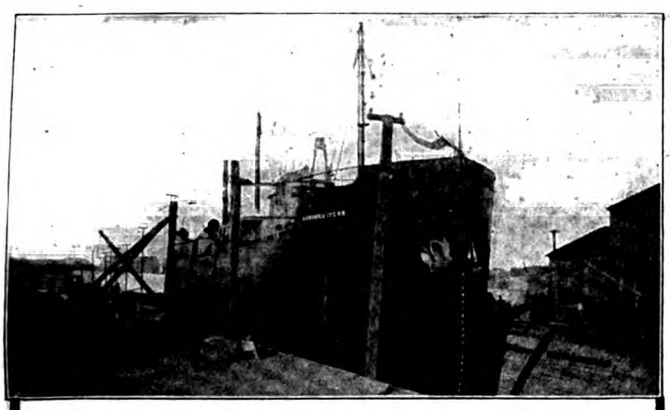

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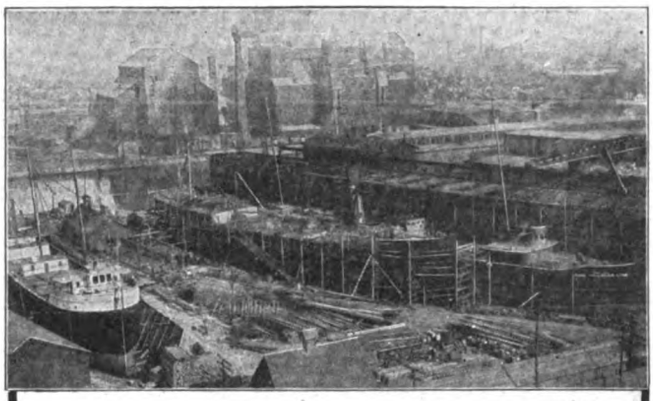

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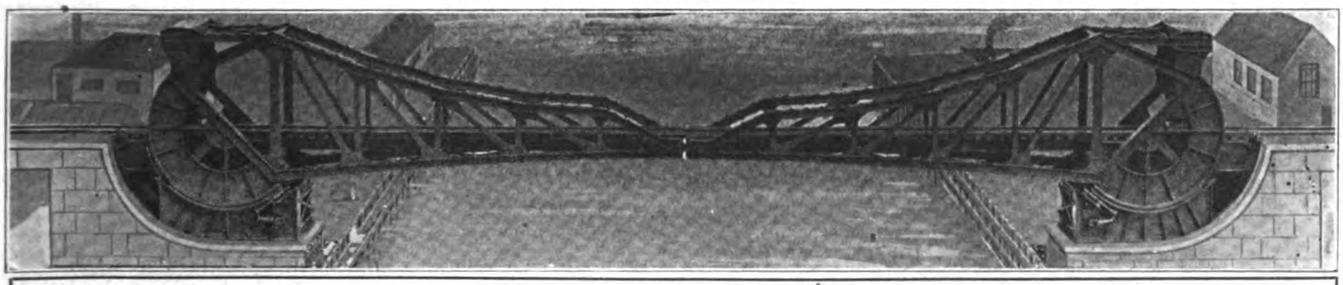

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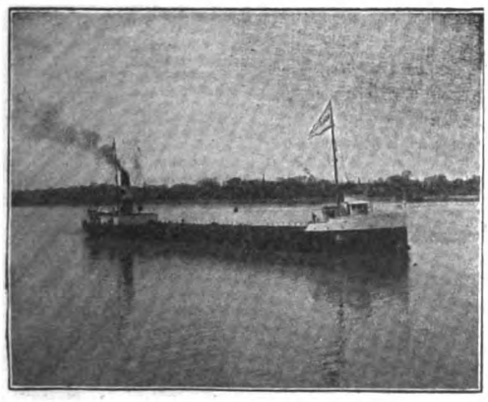
Write for Plans and Estimates

(HIGHEST AWARD AT ST. LOUIS, MO.)

JOHN P. COWING
Contracting Engineer
426 Citizens Bldg., Cleveland, O.



CRAIG SHIP BUILDING CO.

TOLEDO, OHIO.

METAL - AND - WOODEN - SHIP - BUILDERS.

New Dry Dock—525 feet long, 110 feet wide on top, 55 feet wide on bottom, 16 feet of Water on Sill.

Repairs to Metal and Wooden Ships
A SPECIALTY.

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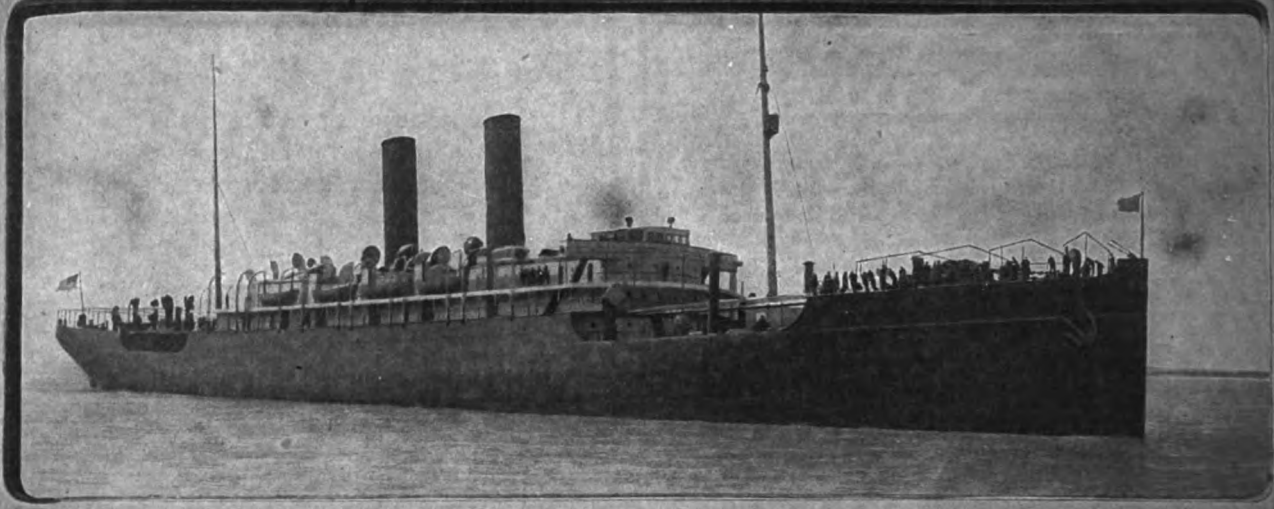
OUR SHIPYARD

WITH ITS ACCOMPANYING DRY DOCKS AND WORKS, WAS CAREFULLY DESIGNED, EQUIPPED AND COMPLETED FOR THE



CONSTRUCTION AND REPAIRING IN EVERY DETAIL OF

BATTLE SHIPS · ARMORED CRUISERS · PROTECTED CRUISERS · GUN BOATS · TORPEDO BOATS · TORPEDO BOAT DESTROYERS · SUBMARINE BOATS · OCEAN LINERS · PASSENGER STEAMERS · FREIGHT CARRIERS · ETC · ETC ·

NEWPORT NEWS SHIPBUILDING & DRY DOCK CO.
1 BROADWAY NEW YORK — NEWPORT NEWS, VA.

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After four years of investigation, the Boiler Committee appointed by the British Admiralty have unanimously declared that water tube boilers are more suitable for Naval purposes than cylindrical, and have again placed THE BABCOCK & WILCOX at the head of all types.

THE BABCOCK & WILCOX CO.

NEW YORK and LONDON

WORKS:

Bayonne, N. J., U. S. A.
Renfrew, Scotland.
Paris, France.
Oberhaussen, Germany.

The Only Chain

"as good as"

a Woodhouse Chain is Another Woodhouse Chain.

Seems strange, perhaps, that one firm should excel in making Marine Chains and other chains when the same materials which we use are used by others.

But knowing how has lots to do with it.

And "knowing how" includes more than the mere practical knowledge of chain-making, for it also includes a knowledge of what is required of certain chains—Crane and Dredger Chains, for instance—and how to meet the requirements.

Try us once and see why folks who know swear by the Woodhouse Brand.

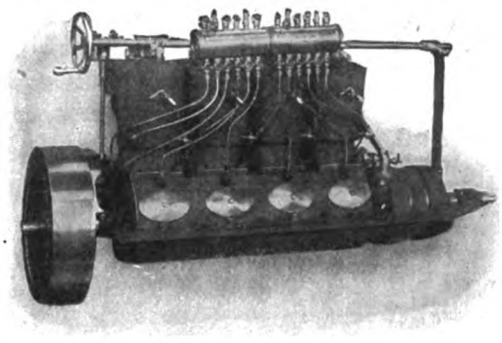
Write us about it anyway.

Woodhouse Chain W'ks,

TRENTON, N. J.

TRUSCOTT

THE DEPENDABLE MARINE MOTOR



Made to withstand the most severe and continuous service. A practical design characterized by the accessibility, compactness and simple ignition, gas producing and oiling features. Perfect control.

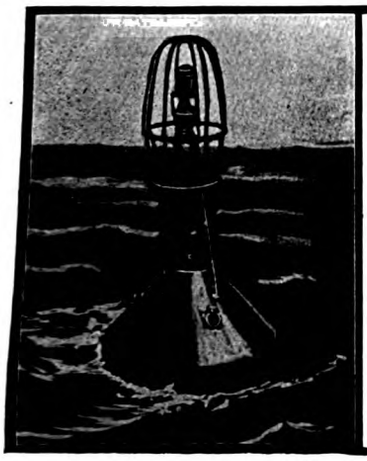
Four cycle type two and four cylinders, from 8 to 65 H. P. Smaller sizes of the two cycle type.

Catalogue and copy of The Launch for the asking.

Department 46.

Truscott Boat Mfg. Co.

ST. JOSEPH, MICHIGAN.



Pintsch Gas Lighted Buoys

BURN CONTINUOUSLY

FROM 80 TO 365 DAYS AND NIGHTS WITHOUT ATTENTION AND CAN BE SEEN AT A DISTANCE OF SIX MILES.

Brilliant & Steady Illumination. Economical & Reliable in Operation.

Adopted by the English, German, French, Russian and United States Light House Departments for Channel and Harbor Lighting; over 1800 gas buoys and gas beacons in service.

Controlled by the

SAFETY CAR HEATING & LIGHTING COMPANY

160 Broadway, NEW YORK CITY.

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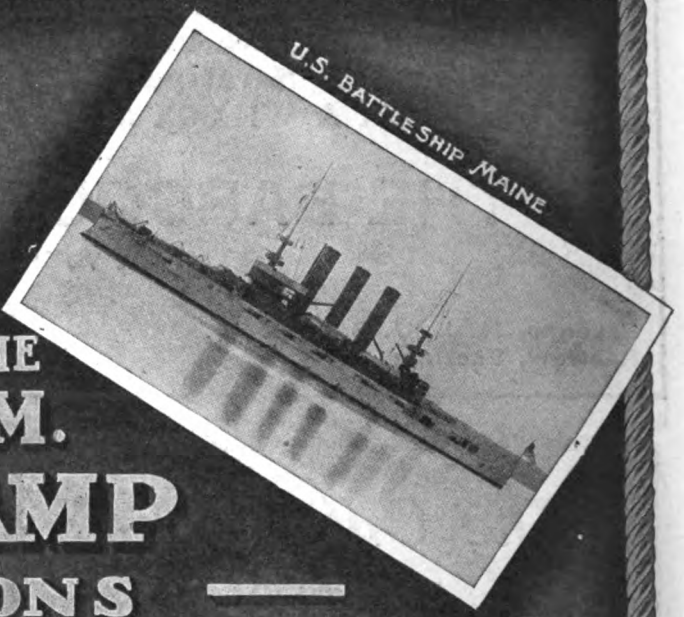
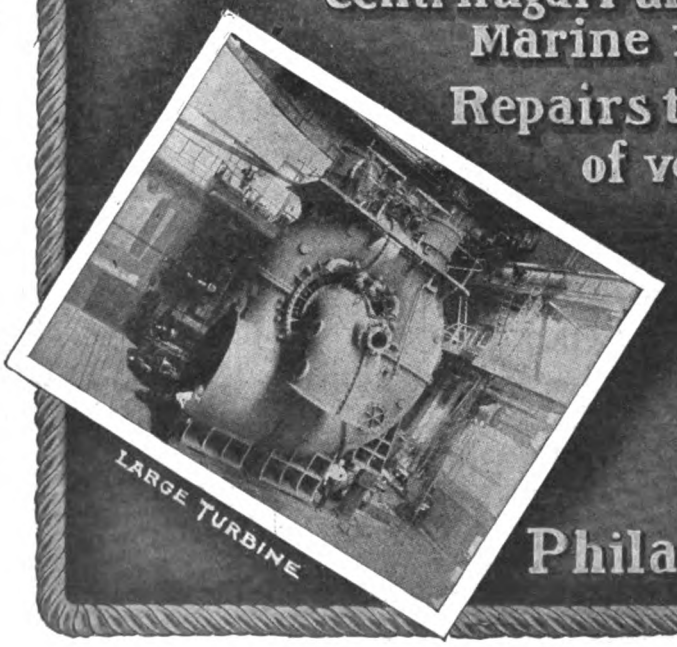


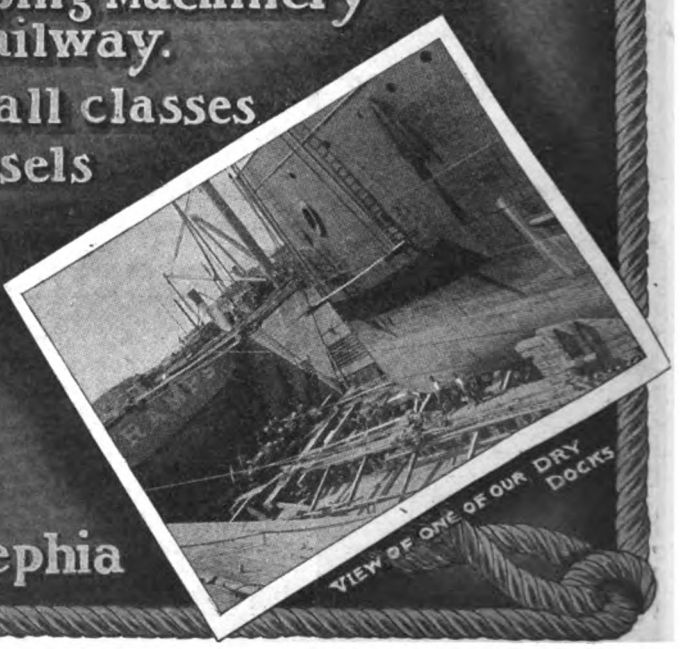
THE
WM.
CRAMP
& SONS
SHIP & ENGINE BUILDING Co.
ESTABLISHED 1830

I.P. MORRIS COMPANY
(ESTABLISHED 1829)

KENSINGTON SHIPYARD Co

WARSHIPS AND MERCHANT STEAMERS
Pumping, Blowing and Hoisting Engines, Dry Docks
Vertical and Horizontal Turbines
Centrifugal Pumping Machinery
Marine Railway.
Repairs to all classes
of vessels





Philadephia

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CLEAN BOILERS

Dearborn Water Treatment made to suit the case. Takes off the scale, keeps it off, stops corrosion and foaming. Send gallon of water for analysis.

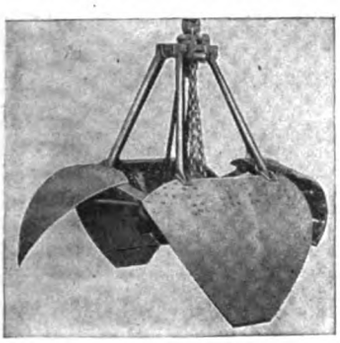
DEARBORN DRUG & CHEMICAL WORKS

G. R. CARR,
Mgr. Marine Dept.

16 BRANCH OFFICES IN THE U. S.

227-234 Postal Telegraph Bldg., CHICAGO.

KIESLER AUTOMATIC BUCKETS



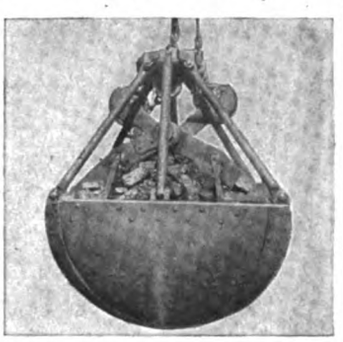
Orange Peel Open

Orange Peel and Clam Shell Types
for handling Coal, Iron Ore and Excavating

We guarantee our Orange Peel to always fill in large lump Soft Coal and Iron Ore. Has two flat lips and will not damage boats or cars. Are from 30 to 50% lighter than any other buckets.
Digging ability due to powerful system of leverage.

Write for Catalogue and Prices.

MAYO & BAILEY 1548 1st Nat'l Bank Bldg. CHICAGO



Orange Peel Closed showing load

THE STANLEY B. SMITH COAL AND DOCK CO.,

TOLEDO HARBOR, TOLEDO, OHIO.

1,800 Feet of Dock. 6 McMyler Derricks. Capacity 8,000 Tons Daily.

Fuel Lighters.—"KANAWHA." "PENNSYLVANIA." "HOCKING."

Docks.—PENNSYLVANIA R. R. HOCKING VALLEY R. R. TOLEDO AND OHIO CENTRAL R. R.

SMITH'S COAL DOCK, Detroit River, DETROIT, MICH.

12 Pockets. Platform. Low Dock.

Operated by STANLEY B. SMITH & CO.

MARINE SUPPLY COMPANY——STORE AND ICE HOUSE ON DOCK.

PITTSBURG COAL COMPANY

GENERAL OFFICE, LAKE DEPARTMENT, PERRY-PAYNE BUILDING, CLEVELAND, OHIO

Steamboat Fueling Facilities at Various Points on the Great Lakes

CLEVELAND HARBOR { 4 Car Dumpers. 3 Lighters. FAIRPORT HARBOR { 1 Car Dumper. 1 Lighter. ERIE HARBOR { 1 Car Dumper. Fuel Pockets.

ASHTABULA HARBOR { 1 Car Dumper. 1 Lighter. DETROIT RIVER BRANCH { Docks and Pockets at Sandwich and Amherstburg.

SAULT RIVER BRANCHES { Dock and Pockets at Detour. Dock and Pockets at Sault Ste. Marie. (The Port Royal Dock Co.)

WE FURNISH ONLY THE BEST GRADE OF

PITTSBURG AND YOUGHIOGHENY COAL

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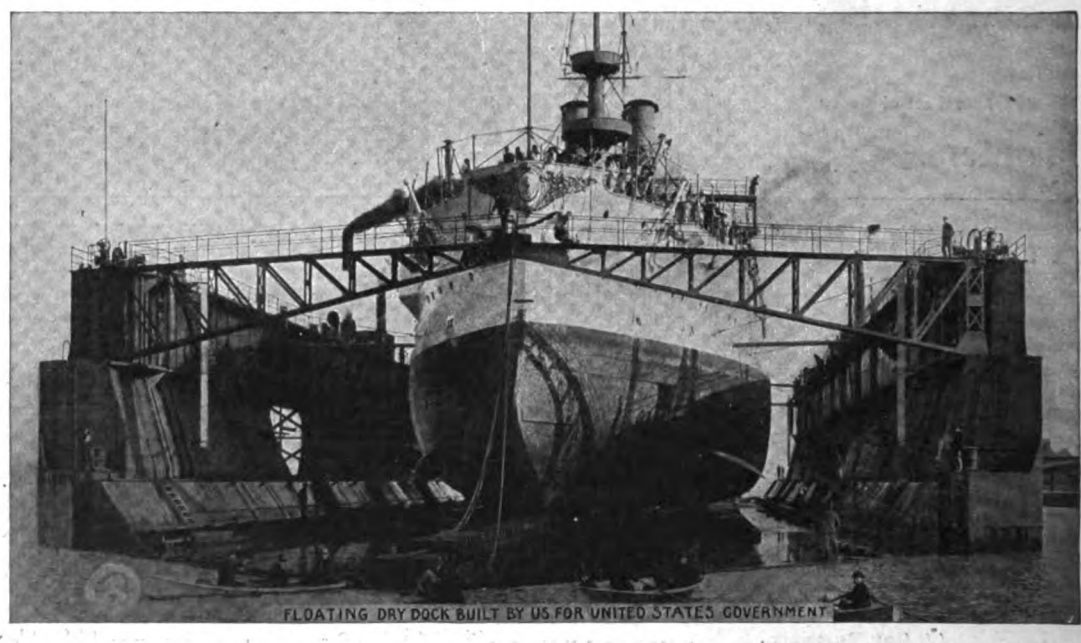
MARYLAND STEEL COMPANY

BUILDERS OF STEEL STEAMSHIPS, TOW BOATS, SAILING VESSELS, BARGES AND STEAM CRAFT OF EVERY DESCRIPTION

STEEL FLOATING DRY DOCKS CAPABLE OF DOCKING THE LARGEST VESSELS



FLOATING DRY DOCK BUILT BY US FOR UNITED STATES GOVERNMENT

SPARROW'S POINT, MARYLAND.

G.H.LEIK

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THE NICLAUSSE BOILER.

The largest merchantmen in the world, the S. S. Minnesota and Dakota, of 33,000 tons and 11,000 H. P. each, are equipped with **Niclausse Boilers.**

641,000 HORSE POWER IN THE NAVIES OF ELEVEN NATIONS.

THE NEW JAPANESE CRUISERS, KATORI AND KASHIMA, OF 16,000 H. P. EACH, AND IN THE UNITED STATES NAVY THE ARMORED CRUISERS PENNSYLVANIA AND COLORADO, 23,000 H. P. EACH, AND THE BATTLESHIPS GEORGIA AND VIRGINIA, 19,000 H. P. EACH, WILL BE FITTED WITH THESE BOILERS.

THE ONLY WATER-TUBE BOILER SUCCESSFULLY USED AND PROVED IN LARGE SHIPS.

Requires no space at sides or rear—cleaned from the front.
Employs no tube-caps—tubes can readily be withdrawn without mutilation.
FORGED STEEL THROUGHOUT.

THE STIRLING COMPANY, General Offices, Trinity Building, NEW YORK.

The Owen Secret Bed

Solves the question of Bed Equipment for Boats, with the greatest economy of space, and perfect convenience and comfort.

A luxurious davenport with no ear-marks of bed combination, for use through the day. For the night—a complete comfortable bed entirely independent, with best bed springs, and regular full size removable mattress, always "made up" with all bed clothing ready for use.

No storing of bedding.
Perfect Ventilation.
Just like a stationary bed.

Send for Circulars

The D. T. OWEN Company

15 Doan Avenue
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LUNKENHEIMER REGRINDING VALVES

THE EMBODIMENT OF PERFECTION.

SELF CONTAINED.

NO EXTRA PARTS REQUIRED TO REPAIR THEM WHEN WORN. A FEW MINUTES SPENT IN REGRINDING AND THEY ARE AS GOOD AS NEW.

If your local dealer cannot furnish them notify us

THE LUNKENHEIMER CO.

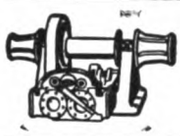
Largest Manufacturers of Engineering Specialties in the World.

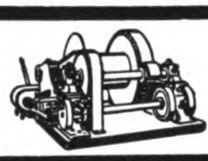
Main Offices and Works CINCINNATI, OHIO, U. S. A.

Branches: New York, 26 Cortlandt St.
London, 35 Great Dover St.

We also manufacture a complete line of Iron and Brass Valves, Oil and Grease Cups, Whistles, Injectors, Water Columns, Lubricators, Etc.

I M. R.





GASOLENE MARINE ENGINES

Suitable for all Boats from 3½ to 200 H.P. Over 100 in successful use. Also the well known and always reliable Woolters Gas or Gasolene Stationary Engines.

HOISTING ENGINES

Of all kinds and sizes, and for all purposes, especially for ship use. Docking and Hauling Engines and Wire Rope Windlasses.

AUTOMATIC TOWING MACHINES

Somewhat the cheapest, and altogether the best. Positively guaranteed. Automatic Fog Whistle Machines Steam Steering Engines.

FOR THESE AND OTHER WELL KNOWN SPECIALTIES ADDRESS ALL INQUIRIES TO.

THE CHASE MACHINE CO. Engineers and Machinists, CLEVELAND, OHIO.

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New York Shipbuilding Company

Main office and works, Camden, N. J., New York office No. 1 Broadway

Builders of

SHIPS — ENGINES — BOILERS
HEAVY MACHINERY

Launch of "Mongolia," Pacific Mail S. S. Co., July 25, 1903.
615 feet long, 65 feet beam, 51 feet deep.

Best Facilities for Repair Work

Pneumatic and Electric Tools;
ample wharfage accomodation.

100 ton crane.

Repairs done under shelter.

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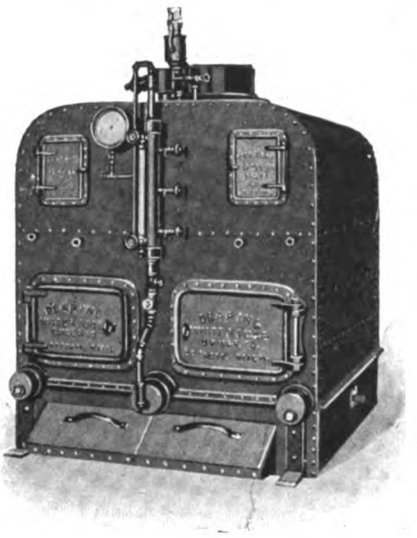
Steamology

A SCIENTIFIC BUNCHING OF FRUITFUL UNITS IN STEAM MAKING MECHANISM

Our pictures are forceful; effective. Thorough draught and diffusion of heat immediately assured. No conflicting currents. Continuous, perfect, economizing combustion and circulation.



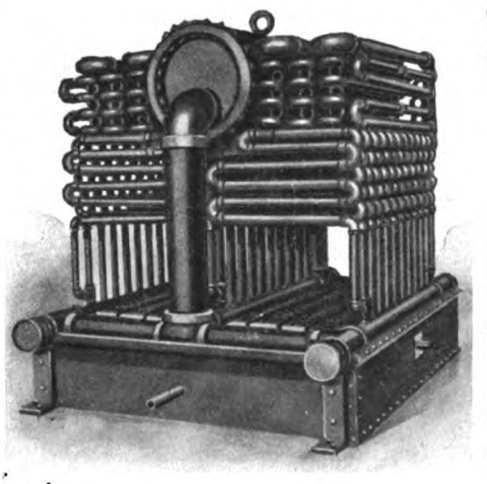
FRONT VIEW

We prove maximum power and minimum fuel cost. We warrant design and construction proof against common evils of bursting tubes and seams.

The Dearing Water-Tube Boilers

are unique, in that their installation, the world over, is unquestionable evidence of the highest producing and lasting qualities in the science of steam engineering.

Note, at the top, that Captain of Ideal Power, our Steam Dome, wherefrom the maximum of superheated, dry steam is always and exceptionally possible under natural or forced and non-priming conditions. Then go the other way and understand how readily you may remove impure feed deposits by blow-off pipe, from settling chambers.



BACK VIEW

Dearing Water-Tube Boiler Co.

DETROIT, MICH.

NECESSARY TO GO FURTHER?
DROP US A POSTAL.

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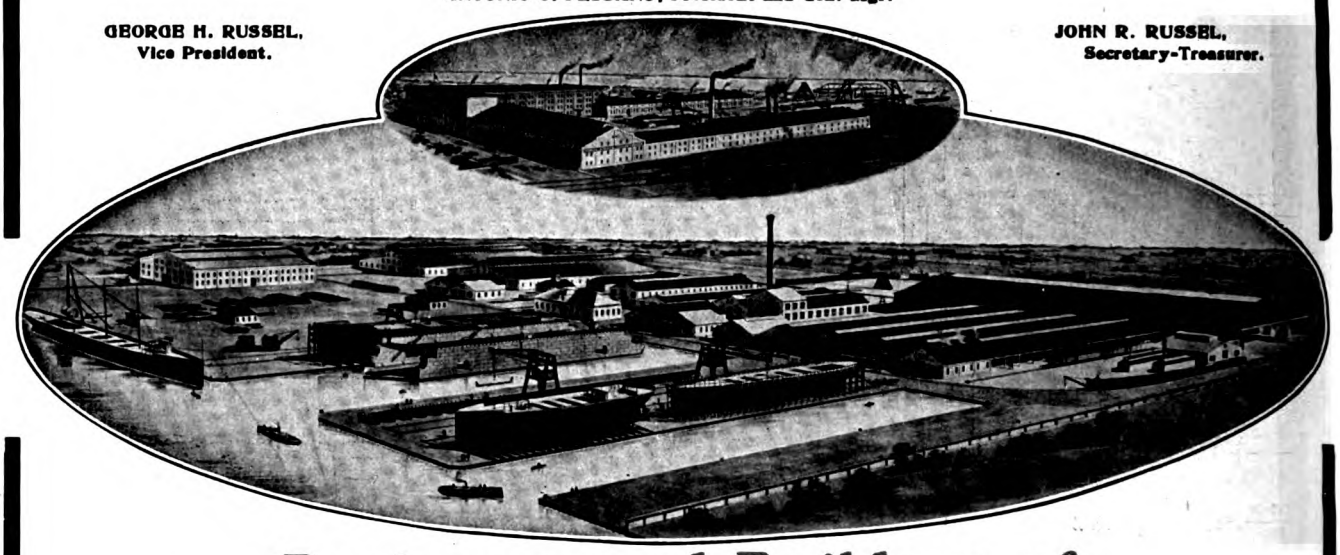
GREAT LAKES ENGINEERING WORKS

DETROIT, MICH.

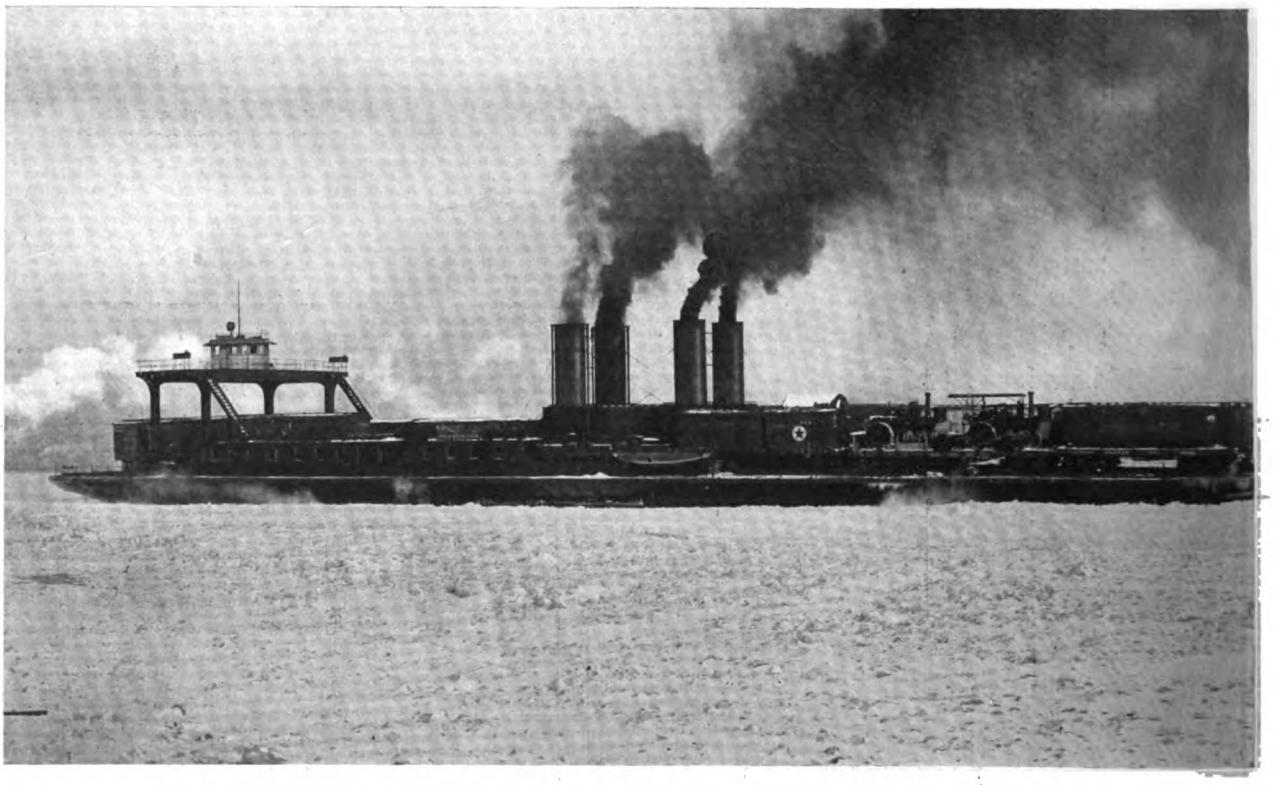
ANTONIO C. PESSANO, President and Gen. Mgr.

GEORGE H. RUSSEL, Vice President.

JOHN R. RUSSEL, Secretary-Treasurer.



Designers and Builders of Steel Freight and Passenger Ships. Marine Engines. = Hydraulic Dredges.



MICHIGAN CENTRAL CAR FERRY DETROIT CROSSING THE DETROIT RIVER IN THE ICE.

Marine Repairs a Specialty

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BELLEVILLE WATER-TUBE BOILERS

NOW IN USE (MARCH, 1905)

On Board Sea-going Vessels, NOT INCLUDING New Installations Building or Erecting.

French Navy	360,560 H. P.
English Royal Navy	966,300 "
Russian Imperial Navy	253,800 "
Japanese Imperial Navy	122,700 "
Austrian Imperial Navy	56,700 "
Italian Royal Navy	32,500 "
Chilian Navy	26,500 "
Argentine Navy	13,000 "
The "Messageries Maritimes" Company	87,600 "
Chemins de fer de l'Ouest: (The French Western Railway Co.) Steamships plying between Dieppe and Newhaven	18,500 "
Compagnie Generale Transatlantique	1,500 "
Total Horse Power of Boilers in Use	1,939,660

Societé Anonyme des Etablissements Delaunay Belleville

CAPITAL: 6,000,000 FRANCS

Works and Dock Yards of the Ermitage at Saint-Denis (Seine), France.

Telegraphic Address: Belleville, Saint-Denis-Sur-Seine

Geo. L. McCurdy

169 Jackson Boulevard

CHICAGO ILLINOIS

INSURANCE

HULLS and CARGOES

DIRECT REPRESENTATIVE OF LEADING AMERICAN AND FOREIGN UNDERWRITERS

ASHTON

Cam Lever Pop Safety Valves and Non-Corrosive Steam Gauges.

give highest efficiency and durability. Specify them and get the best.

The Ashton Valve Co.

Boston New York Chicago

U. S. A.

If your contract requires delivery a part each week, order from our stock and save handling, storage and crowding your shop room.

LOOK IN OUR STOCK LIST.

THE BOURNE-FULLER CO.

IRON, STEEL

PIG IRON

COKE

Cleveland, Ohio

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See accompanying index of Advertisers for full addresses of concerns in this directory.

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Great Lakes Engineering Works.....Detroit.
Mietz, Aug. .....New York.

AIR PORTS, DEAD LIGHTS, ETC.

Marine Mfg. & Supply Co.....New York.

AIR PUMPS AND APPLIANCES.

Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.

ANCHORS.

Bowers, L. M. & Co.....Binghamton, N. Y.
Seaboard Steel Casting Co.....Chester, Pa.

ANTI-FOULING AND ANTI-CORROSIVE COMPOSITION FOR STEEL VESSELS.

Holzapfel's American Composition Co....
.....New York.

ANTI-FRICTION METALS.

Cramp, Wm. & Sons.....Philadelphia.

ARTIFICIAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit
Great Lakes Engineering Works.....Detroit
Sturtevant, B. F., Co.....Hyde Park, Mass.

ASH EJECTORS.

Great Lakes Engineering Works.....Detroit.

ATTORNEYS AND PROCTORS IN ADMIRALTY.

Gilchrist, Albert J.....Cleveland.
Goulder, Holding & Masten.....Cleveland.
Hoyt, Dustin & Kelley.....Cleveland.
Kremer, C. E.....Chicago.
MacDonald, Ray G.....Chicago.
Potter & Potter.....Buffalo.
Shaw, Warren, Cady & Oakes.....Detroit.
White, Johnson, McCaslin & Cannon Cleveland

BAROMETERS, MARINE GLASSES, ETC.

Ritchie, E. S. & Sons.....Brookline, Mass.

BELT CONVEYORS.

Link Belt Machinery Co.....Chicago.

BLOCKS, SHEAVES, ETC.

Boston & Lockport Block Co.....Boston, Mass.
Cleveland Block Co.....Cleveland.

BLOWERS.

Power Specialty Co.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

BOAT BUILDERS.

Drein, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, David.....New York.
Lane & DeGroot....Long Island City, N. Y.
Marine Construction & D. D. Co.....
.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co....St. Joseph, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

BOILER CLEANING DEVICE.

Power Specialty Co.....Detroit.

BOILER COMPOUNDS.

Dearborn Drug & Chemical Works....Chicago.

BOILER MANUFACTURERS.

Almy Water Tube Boiler Co..Providence, R. I.
American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Babcock & Wilcox Co.....New York.
Bertram Engine Works Co., Ltd.....
.....Toronto, Can.
Chicago Ship Building Co.....Chicago.
Cramp, Wm. & Sons.....Philadelphia.
Dearing Water Tube Boiler Co.....Detroit.
Delauney, Belleville & Co...St. Denis, France.
Detroit Ship Building Co.....Detroit.
East End Boiler Works.....Detroit.
Fletcher, W. A. & Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass.
Georgian Bay Engineering Works.....
.....Midland, Ont.
Great Lakes Engineering Works.....Detroit.
Kingsford Foundry & Machine Works....
.....Oswego, N. Y.
Marine Iron Works.....Chicago.

BOILER MANUFACTURERS—Continued.

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Milwaukee Dry Dock Co.....Milwaukee.
Mosher Water Tube Boiler Co....New York.
Newport News Ship Building Co.....
.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co....
.....Duluth, Minn.
Roberts Safety Water Tube Boiler Co....
.....New York.
Stirling, The Co.....New York.
Superior Ship Building Co.....Superior, Wis.
Taylor Water Tube Boiler Co.....Detroit.
Willard, Chas. P. & Co..Winthrop Harbor, Ill.

BOILER RIVETS.

Bourne-Fuller Co.....Cleveland.

BOILER STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co..Cuyahoga Falls, O.

BRASS AND BRONZE CASTINGS.

Cramp, Wm. & Sons.....Philadelphia.
Fore River Ship & Engine Co..Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lunkenheimer Co.....Cincinnati.
Macbeth Iron Co.....Cleveland.

BRIDGES, BUILDERS OF.

Cowing, John P.....Cleveland.
Scherzer Rolling Lift Bridge Co.....Chicago.

BUCKETS, ORE AND COAL.

Brown Hoisting & Conveying Machine Co.
.....Cleveland.
McMyler Mfg. Co.....Cleveland.
Mayo & Bailey .....Chicago.

BULKHEAD DOORS, WATERTIGHT.

"Long Arm" System Co.....Cleveland.

CABIN AND CABINET FINISHING WOODS.

Martin-Barriss Co.....Cleveland.

CANVAS SPECIALTIES.

Baker & Co., H. H.....Buffalo.
Bunker, E. A. .....New York.
Upson-Walton Co.....Cleveland.

CAPSTANS.

American Ship Windlass Co..Providence, R. I.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.

CARPETS, RUGS AND FURNITURE.

Williams & Rodgers Co.....Cleveland.

CEMENT, IRON FOR REPAIRING LEAKS.

Smooth-On Mfg. Co.....Jersey City, N. J.

CHAINS.

Woodhouse Chain Works.....Trenton, N. J.

CHAIN CONVEYORS, HOISTS.

Brown Hoisting Machinery Co. (Inc.)....
.....Cleveland.
General Electric Co.....Schenectady, N. Y.

CHAIN HOISTS.

Boston & Lockport Block Co....Boston, Mass.

CHARTS.

Penton Publishing Co.....Cleveland.
Potter, J. D.....London.

CLOCKS (Marine and Ship's Bell) AND CHRONOMETERS.

Ashton Valve Co.....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.

Hanna, M. A. & Co.....Cleveland.
Ironville Dock & Coal Co.....Toledo, O.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.

COAL AND ORE HANDLING MACHINERY.

Brown Hoisting Machinery Co. (Inc.)....
..... Cleveland.
Link Belt Machinery Co.....Chicago.
McMyler Mfg. Co.....Cleveland.

COMPASSES.

Ritchie, E. S. & Sons.....Brookline, Mass.

CONDENSERS.

Great Lakes Engineering Works.....Detroit.
Thropp & Sons Co., John E...Trenton, N. J.

CONTRACTORS FOR PUBLIC WORKS.

Breymann & Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co.,
..... Duluth, Minn.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M.....Detroit.

CORDAGE.

Baker & Co., H. H.....Buffalo.
Upson-Walton Co.....Cleveland.

CORK JACKETS AND RINGS.

Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.

CRANES, TRAVELING.

Brown Hoisting Machinery Co.....Cleveland.
McMyler Mfg. Co.....Cleveland.

DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A.....New York.

DREDGING CONTRACTORS.

Breymann & Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.
..... Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co.
..... Duluth, Minn.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M.....Detroit.

DRYING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

DRY DOCKS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co....Superior, Wis.

ELECTRIC HOISTS AND CRANES.

General Electric Co.....Schenectady, N. Y.

ELECTRIC LIGHT AND POWER PLANTS.

General Electric Co.....Schenectady, N. Y.
Mietz, Aug. .....New York.
Sturtevant, B. F. & Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.

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WANTED and FOR SALE Department.

PROPOSALS.

PROPOSALS FOR DREDGING.—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 19, 1905. Sealed proposals for improving Cleveland Harbor, Ohio, by dredging, will be received at this office until 2 P. M., May 22d, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN. C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. May 18

U. S. Engineer Office, Buffalo, N. Y. April 26, 1905. Sealed proposals for dredging in Buffalo River Entrance Channel will be received here until 11 A. M., May 26, 1905, and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Engrs. May 18

U. S. Engineer Office, Buffalo, N. Y., April 22, 1905. Sealed proposals for extending south pier and placing concrete superstructure on north pier at Erie, Pa., will be received here until 11 A. M., May 22, 1905, and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Engrs. May 18

U. S. ENGINEER OFFICE, Buffalo, N. Y., April 20, 1905.—Sealed proposals for breakwater extension at Cape Vincent, N. Y. will be received here until 11 A.M. May 20, 1905 and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Eng'rs. may 18

U. S. ENGINEER OFFICE,—Grand Rapids, Mich., May 3, 1905. Sealed proposals for Excavating new channel from Kalamazoo River to Lake Michigan will be received here until 3 p. m., June 2, 1905, and then publicly opened. Information furnished on application. M. B. ADAMS, Col., Eng'rs. May 25

U. S. Engineer Office, Galveston, Tex., May 1, 1905.—Sealed proposals, in triplicate, for suction dredge, will be received here until 12 m., May 31, 1905, and then publicly opened. Informaiton furnished on application. Edgar Jadwin, Capt., Engrs. May 25

U. S. Engineer Office, Buffalo, N. Y., April 29, 1905.—Sealed proposals for construction of stone superstructure and sea slope, and for stone riprap, on South Harbor section of Buffalo breakwater, will be received here until 11 a. m. May 29, 1905, and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Engrs. May 25

U. S. Engineer Office, Buffalo, N. Y., May 6, 1905. Sealed proposals for channel excavation at Ogdensburg Harbor, N. Y., will be received here until 11 A. M., June 6, 1905, and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Engrs. June 1

PROPOSALS FOR REPAIR OF JETTIES.—U. S. Engineer Office, 262 Huron Street, Cleveland, Ohio, May 8, 1905. Sealed proposals for Stone Reinforcement and Repair of Jetties at the harbors of Port Clinton, and Vermilion, Ohio, will be received at this office until 2 P. M., June 8, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. June 1

PROPOSALS FOR DREDGING.—U. S. Engineer Office, 262 Huron Street, Cleveland, Ohio, May 5, 1905. Sealed proposals for dredging in Sandusky Harbor, Ohio, will be received at this office until 2 P. M., Standard Time, June 5, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col., Corps of Engineers, U. S. A. June 1

U. S. Engineer Office, Duluth, Minn., May 4, 1905. Sealed proposals for pier work at Port Wing, Wis., will be received here until noon, June 5, 1905, and then publicly opened. Information on application. Chas. L. Potter, Major, Engrs. June 1

PROPOSALS.

U. S. Engineer Office, Detroit, Mich., May 11, 1905. Sealed proposals for building concrete superstructure on main pier at Harbor Beach harbor of refuge, Mich., will be received here until 12:00 M., June 10, 1905, and then publicly opened. Information furnished on application. Lansing H. Beach, Major, Engrs. June 8

FOR SALE.

Patent on Valuable Nautical Invention.

A device in the form of an air buoy for definitely locating sunken vessels. Should the vessel sink upon which this buoy is placed, the buoy floats, and a line, made fast in a separate compartment, unreels until the vessel strikes bottom, thereby locating the exact position of the sunken vessel. This buoy is also adapted for use as a mooring buoy for yachts of all sizes, and for all floating property. It can be manufactured and sold for much less than any other buoy in use. Will sell the patent for cash or exchange for vessel or other property. Address, Capt. J. Fred Tribble, 59 Broadway, Norwich, Conn. t.f.

Tug Wm. Engel.

A first class fishing rig for sale. Tug suitable for fishing or towing. For further information write to Thomas Mader, 81 Middle St., Kenosha, Wis. t.f

Dredging Outfits for Sale.

Two dipper dredges one partly burned; two combination dipper and clam shell dredges; four tugs; dump scows; flat scows; dredging appliances. Complete business to be closed out. For particulars address Carkin, Stickney & Cram, Detroit. May 25

Lake Tug for Sale.

Tug Kate Williams—rebuilt 1901, rates 1½. Moored Manitowoc, Wis., where she may be inspected. For prices and terms address Lake Shore Stone Co., Milwaukee, Wis. May 25

For Sale.

Ten shares of stock of Manitowoc Dry Dock Company, Manitowoc, Wis. Address Box 80, Marine Review. t. f.

The Steamer Gordon Campbell.

Burned on spar-deck—easy tc cut down to lumber barge, to carry million feet. Machinery and boilers untouched. Hull untouched and in good condition. Boat in dry dock and thoroughly overhauled last summer. Can be seen in Chicago. Want best offer. Address Room 613, 59 Dearborn St., Chicago. t f

FOR SALE.

Tug Jim Pullar and Scow.

Tug—built in 1894; 61 ft. long; 15 ft. beam. Water tube boiler. Compound condensing engine. Strong and seaworthy.

Scow—five years old. Excellent construction; 132 ft. long; 29½ ft. wide at center, 26 ft. wide at ends. Platform style, with stake pockets.

Tug and Scow recently overhauled and are in good condition. May be seen at Washburn, Wis., dock.

Address, Fowler-Jacobs Co., Fisher Building, Chicago. t.f.

Lighter for Sale.

Lighter Ann Walker. Hull 93 x 20 x 9. House 79 x 18 x 8. Reason for selling, owner has no further use for her Address Mutual Transit Co., Buffalo, N.Y. May 18

For Sale.

FOR SALE.—Electric dynamos, direct connected to engines, also search-lights for marine work; good condition; cheap. JORDAN BROS., 74 Beekman St., New York. April 27

To close estate will sacrifice 14 h. p. ***Gasoline Cruising Yacht,*** 36 ft. over all. 2 ft. 4 in. draught; built one year. Also one ***Cruising Yacht,*** triple expansion engines, 75 h. p. new Roberts boiler, carry 30 people. Address "OWNER," 39 East 3d Street, Brooklyn, N. Y.

WANTED.

Salesmen Wanted.

Wanted.—Salesmen or agents to sell a patented specialty of great merit for boilers, which is already being used by the largest concerns. Address Power Specialty Co., 513 Washington Arcade, Detroit, Mich. t.f.

Lighters Wanted.

Wanted—three lighters to carry not less than 400 tons each, for Cleveland delivery. State age and condition. E. M. Graves, Indianapolis, Ind.

Wanted.

Second hand head light (electric), suitable for a boat 24 ft. beam, 100 ft. long; three decks. F. Heywood, 420 Third street W., Minneapolis, Minn.

McMyler Derrick Wanted.

McMyler Derrick to handle five tons on 45 ft. boom. State condition, delivery and price. E. M. Graves, Indianapolis, Ind.

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Buyers' Directory of the Marine Trade.—*Continued.*

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Bertram Engine Works Co., Ltd.....Toronto, Can.
Chicago Ship Building Co.....Chicago.
Chase Machine Co.....Cleveland.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Dake Engine Co.....Grand Haven, Mich.
Detroit Ship Building Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Shipbuilding Co....Quincy, Mass.
Great Lakes Engineering Works.Detroit, Mich.
Hall Bros.....Philadelphia.
Lockwood Mfg. Co.....East Boston, Mass.
Marine Iron Works.....Chicago.
Maryland Steel Co.....Sparrows Point, Md.
Mietz, Aug.....New York.
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
Newport News Ship Building Co.....Newport News, Va.
New York Shipbuilding Co....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Mich.
Roach's Ship Yard.....Chester, Pa.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Trout, H. G.....Buffalo.
Willard, Chas. P. & Co..Winthrop Harbor, Ill.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.
Marine Mfg. Supply Co.....New York.

ENGINE TESTING.

Kreer & Parsons.....Chicago.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co.....Chicago.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
New York Belting & Packing Co..New York.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Hynd, Alexander.....Cleveland.
Hunt, Robt. W. & Co.....Chicago.
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons.....Chicago.
Lovejoy, H. O.....Buffalo.
Mosher, Chas. D.....New York.
Nacey, James.....Cleveland.
Rice, Henry.....Buffalo.
Roelker, H. B.....New York.
Wood, W. J.....Chicago.

FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Hyde Park, Mass.

FEED WATER PURIFIERS AND HEATERS.

Greacen-Derby Engineering Co.....Perth Amboy, N. J.
Ross Valve Co.....Troy, N. Y.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y.

FORGES.

Sturtevant, B. F. Co.....Boston.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co...Cleveland.
Fore River Shipbuilding Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

FLUE WELDING.

Fix's, S. Sons.....Cleveland.

FUEL ECONOMIZERS.

Sturtevant Co., B. F.....Hyde Park, Mass.

FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
Ironville Dock & Coal Co.....Toledo, O.
Parker Bros. Co., Ltd.....Detroit.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit.
Smith Coal & Dock Co., Stanley B. Toledo, O.

FUELING PLANTS, BUILDERS OF

Link Belt Machinery Co.....Chicago.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co..New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.
Georgian Bay Engineering Works.....Midland, Ont.

GAUGES, STEAM AND VACUUM.

Ashton Valve Co.....Boston.
Lunkenheimer Co.....Cincinnati.

GAUGES, WATER.

Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co.....Cincinnati, O.

GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J

GREASE EXTRACTORS.

Greacen-Derby Engineering Co.....Perth Amboy, N. J.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.).....Cleveland.
Chase Machine Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....Midland, Ont.
Hyde Windlass Co.....Bath, Me.
McMyler Mfg. Co.....Cleveland.
Marine Iron Co.....Bay City.
Mietz, Aug.....New York.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co...Cuyahoga Falls, O.

HOSE, RUBBER.

New York Belting & Packing Co..New York.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.

Ashton Valve Co.....Boston.

INJECTORS.

American Injector Co.....Detroit.
Crane Co.....Chicago.
Jenkins Bros.....New York.
Lunkenheimer Co.....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.

Elphicke, C. W. & Co.....Chicago.
Fleming & Co., E. J.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F..New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland, O.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Georgian Bay Engineering Works.....Midland, Ont.
Marine Iron Works.....Chicago.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Winthrop Harbor, Ill.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong, Cork Co.....Pittsburg.
Drein, Thos. & Son.....Wilmington, Del.
Gaynor, T. F.....New York.
Kahnweiler's Sons, D.....New York.
National Cork Co.....Brooklyn.

LIGHTS, SIDE AND SIGNAL.

Russell & Watson.....Buffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.
Walker & Sons, Thomas....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph..Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.
Lunkenheimer Co.....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.

MACHINISTS.

Chase Machine Co.....Cleveland.
Hickler Bros.....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros.....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Hyde Park, Mass.

NAUTICAL INSTRUMENTS.

Ritchie, E. S., & Sons.....Brookline, Mass.

NAVAL ARCHITECTS.

Hynd, Alexander.....Cleveland
Kidd, Joseph.....Duluth, Minn.
Kreer & Parsons.....Chicago
Lovejoy, H. O.....Buffalo
Matteson & Drake.....Philadelphia
Mosher, Chas. D.....New York
Nacey, James.....Cleveland
Rice, Henry.....Buffalo
Wood, W. J.....Chicago

OAKUM.

Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.

Mietz, Aug.....New York.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph..Jersey City, N. J.
Standard Oil Co.....Cleveland.

PACKING.

Crane Co.....Chicago
Jenkins Bros.....New York
Katzenstein, L. & Co.....New York
New York Belting & Packing Co..New York.

PAINTS.

Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland

PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia.

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WANTED and FOR SALE Department Continued.

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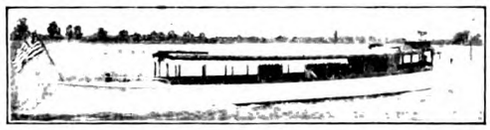
FOR SALE—Length 78 ft., beam 18 ft., triple expansion engines, water-tube boiler, allowed 200 lbs.; electric light, search light, mahogany deck-house 9 x 16, power launch, complete outfit, all in first-class condition. One of the best family cruising yachts on the Lakes. Inquire Wickes Bros., Saginaw, Mich. tf



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This up-to-date Gasoline Yacht 65x9½, mahogany finished throughout; large cabin, plate glass windows, mahogany blinds; fine carpets and upholstery; excellent electric light plant—dynamo, storage batteries and search light. Entire boat can be easily converted into cabin if desired.

Rapid fire yacht cannon; anchor, life preservers, flags, etc., complete. Very fast 4 cylinder, 4 cycle King engine of 50 h. p. Cost nearly $8,000, will sell at great bargain.

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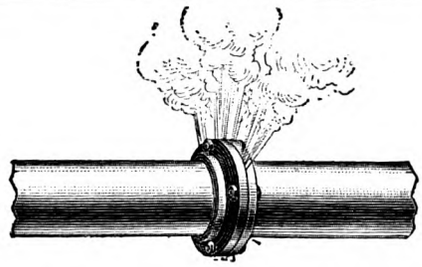
For Sale.—One 50 H. P. Scotch Marine Boiler, 10 ft. long, 78 in. diameter, 160 lbs. steam pressure. Manufactured by Ritter & Co, Buffalo, N. Y. In first-class shape. For particulars, write The Detroit Stove Works, Detroit, Mich. t. f.



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will stop leaks like the above with steam on. Write us about it.

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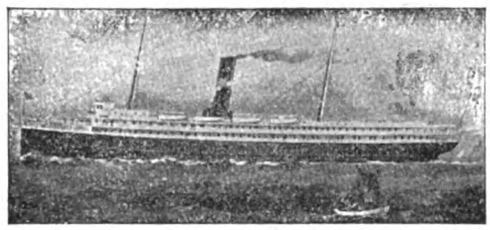

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LIGHT STRONG DURABLE

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TRADE MARK

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Repairing of Hulls and Machinery.

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Buyers' Directory of the Marine Trade.—*Continued.*

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co. .....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Lake Superior Contracting & Dredging Co. .....Duluth, Minn.
Parker Bros. Co., Ltd.....Detroit.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H..Milwaukee.
Sullivan, M..... Detroit

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland, O.
Crane Co. .....Chicago.
Macbeth Iron Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

PRESSURE REGULATORS.

Kieley & Mueller .....New York.
Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Hyde Windlass Co.....Bath, Me.
Lockwood Mfg. Co. .....East Boston, Mass.
Marine Iron Works.....Chicago.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
Roelker, H. B.....New York.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co....Superior, Wis.
Thropp & Sons Co., J. E.....Trenton, N. J.
Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.

General Electric Co.....Schenectady, N. Y.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
Great Lakes Engineering Works.....Detroit.
Marine Iron Works.....Chicago.
Kingsford Foundry & Machine Works.... .....Oswego, N. Y.

RANGES.

Stamford Foundry Co.....Stamford, Conn.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register.....Cleveland.

REPAIRS—ENGINE AND BOILER.

(See also Boiler Manufacturers and Engine Builders.)
Georgian Bay Engineering Works..... .....Midland, Ont.

RIVETS, STEEL FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.

Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Lunkenheimer Co. .....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

General Electric Co.....Schenectady, N. Y.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland, O.
Otis Steel Co.....Cleveland.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
Atlantic Works .....East Boston, Mass.
Bertram Engine Works Co., Ltd.Toronto, Can.
Buffalo Dry Dock Co.....Buffalo.
Cramp, Wm. & Sons.....Philadelphia.
Craig Ship Building Co.....Toledo, O.
Chicago Ship Building Co.....Chicago.
Detroit Ship Building Co.....Detroit.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Maryland Steel Co.....Sparrows Point, Md.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co..... .....Newport News, Va.
New York Shipbuilding Co....Camden, N. J.
Roach's Ship Yard.....Chester, Pa.
Shipowner's Dry Dock Co.....Chicago.
Smith & Son, Abram.....Algonac, Mich.
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
Marine Mfg. & Supply Co.....New York.
Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.

Kidd, Joseph .....Duluth.
Kreer & Parsons .....Chicago.
Matteson & Drake .....Buffalo.
Rice & Lovejoy .....Buffalo.
Steel, Nacey & Hynd.....Cleveland.
Wood, W. J.....Chicago.

SHIP LANTERNS AND LAMPS.

Russell & Watson.....Buffalo.

SHIPMATE RANGES.

Stamford Foundry Co.....Stamford, Conn.

SHIP TIMBER.

Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co..Cuyahoga Falls, O.
Reading Iron Co.....Reading, Pa.

STEAM VESSELS FOR SALE.

Gilchrist & Co., C. P.....Cleveland.
Holmes, Samuel .....New York.
Lester, S. S.....Quebec, Can.
McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line .....New York.
Anchor Line .....Buffalo.
Boston Steamship Co.....Boston.
International Mercantile Marine Co..... .....Philadelphia.
New York & Cuba Mail S. S. Co...New York.
Red Star Line.....New York.
United Fruit Co.....Bostor

STEEL CASTINGS.

Otis Steel Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
Chase Machine Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.
Moulton Steering Engine Co.....New York.
Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J.....Boston.
Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, Edward .....Buffalo.
Hynd, Alexander .....Cleveland.
Lovejoy, H. O.....Buffalo.
Matteson & Drake .....Philadelphia.
Parker Bros. Co., Ltd.....Detroit.
Nacey, James .....Cleveland.
Rice, Henry .....Buffalo.
Steel, Adam .....Cleveland.
Wood, W. J.....Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co.....Chicago.
Lunkenheimer Co.....Cincinnati, O.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co..Providence, R. I.
Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co..... .....Kingston, Ont.

TRAPS, STEAM.

Kieley & Mueller .....New York.
Sturtevant Co., B. F.....Hyde Park, Mass.

TRUCKS.

Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.

Shelby Steel Tube Co.....Pittsburg, Pa.

VALVES, STEAM SPECIALTIES, ETC.

Ashton Valve Co.....Boston.
Crane Co. .....Chicago.
Jenkins Bros. .....New York.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
Ross Valve Co.....Troy, N. Y.

VALVES FOR WATER AND GAS.

Lunkenheimer Co.....Cincinnati.
Ross Valve Co.....Troy, N. Y.

VARNISHES.

Detroit Varnish Co.....Detroit.
Detroit White Lead Works.....Detroit.
New Jersey Zinc Co.....New York.
Also Ship Chandlers.

VENTILATING APPARATUS FOR SHIPS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

VESSEL AND FREIGHT AGENTS.

Boland, John J.....Buffalo.
Brown & Co.....Buffalo.
Elphicke, C. W. & Co.....Chicago.
Fleming & Co., E. J.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hall, John B.....Buffalo.
Helm & Co., D. T.....Duluth.
Hawgood & Co., W. A.....Cleveland.
Holmes, Samuel .....New York.
Hutchinson & Co.....Cleveland.
Lester, S. S. .....Quebec, Can.
McCarthy, T. R.....Montreal.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.

VESSEL FURNISHINGS.

Williams & Rodgers Co.....Cleveland

WATER GAUGES.

Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co.....Cincinnati, O

WATERTIGHT BULKHEAD DOORS.

"Long Arm" System Co.....Cleveland.

WHISTLES, STEAM.

Ashton Valve Co.....Boston.
Lunkenheimer Co.....Cincinnati.

WILFORD'S WATERPROOF CLOTH.

Bunker, E. A. .....New York.

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

WINDLASSES.

American Ship Windlass Co..Providence, R. I.
American Ship Building Co.....Cleveland.
Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....New York.

WINCHES.

American Ship Windlass Co..Providence, R. I.
Georgian Bay Engineering Works..... .....Midland, Ont.
Hyde Windlass Co.....Bath, Me.

WOOD PRESERVING PAINT.

Carbolineum Wood Preserving Co..Milwaukee.

WOOD WORKING MACHINERY.

Atlantic Works, Inc.....Philadelphia.

WRECKING AND SALVAGE COMPANIES.

Donnelly Salvage & Wrecking Co..... .....Kingston, Ont.
Parker Bros. Co., Ltd.....Detroit.

YACHT AND BOAT BUILDERS.

Bertram Engine Works Co., Ltd..Toronto, Can.
Drein, Thos. & Son.....Wilmington, Del.
Georgian Bay Engineering Works..... .....Midland, Ont.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co..... .....Winthrop Harbor, Ill.

YACHT BROKERS.

Clapham & Clapham.....New York.

YAWLS.

Drein, Thos. & Son.....Wilmington, Del.

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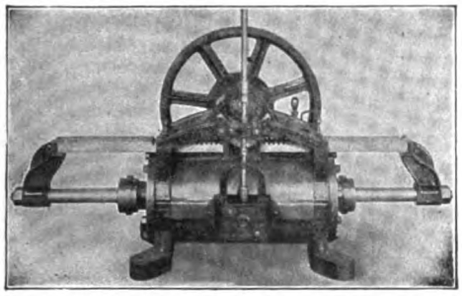

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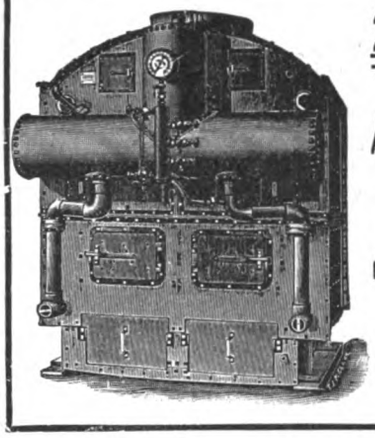

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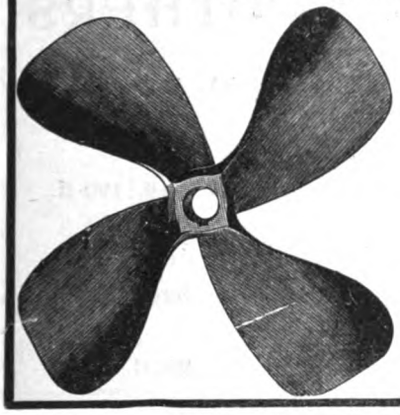

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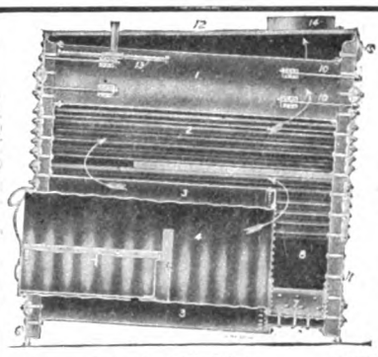
H. G. TROUT,
King Iron Works,
226 Ohio St.,
BUFFALO, N. Y.



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ANY SIZE, OUTSIDE OR INSIDE DIAMETER.
AVERAGE LENGTH OF HOLLOW BARS EIGHT TO TEN FEET.
STAYBOLT BARS
BOTH HOLLOW AND SOLID,
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Makers of only the Highest Quality of Staybolt Material, in Hollow and Solid Bars, from the Best Double-Refined Charcoal Iron or Steel.

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The Only Staybolt Iron which responds in service to the expansion and contraction of fire box; which relieves the material in molecular strains; which is self protective from burning; which does not make the side sheets crack; which earns its own cost in oxygen through it to the fire; always sure in giving warning of breakage.

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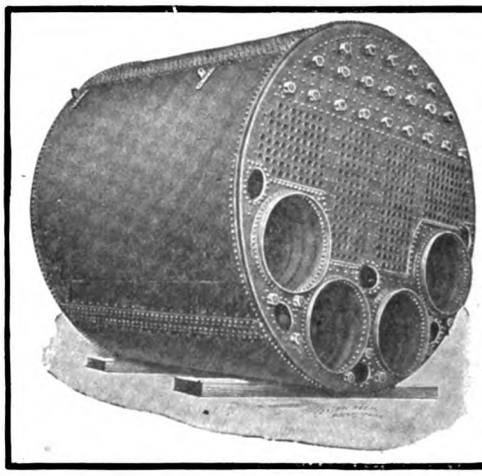

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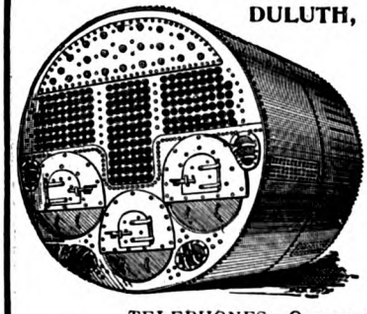

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Capacity, 1,000 tons.
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Will contract to remove ROCK or EARTH on the Great Lakes to 40 ft. depth.
To remove ROCK on Atlantic Coast to 40 ft. depth.

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McMyler derrick handling 10 tons at 75 ft. radius.

Small Scows.

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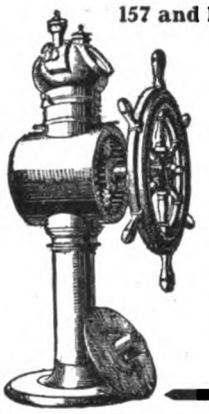

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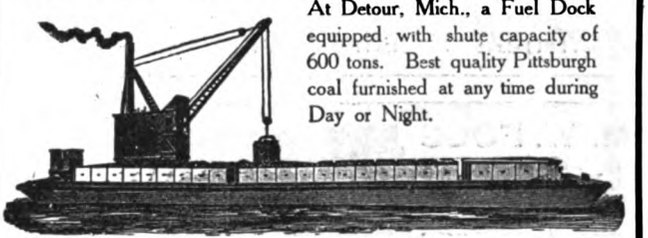

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Toledo Office, 429 Spitzer Bldg.
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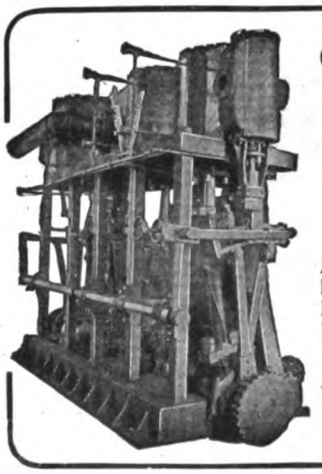

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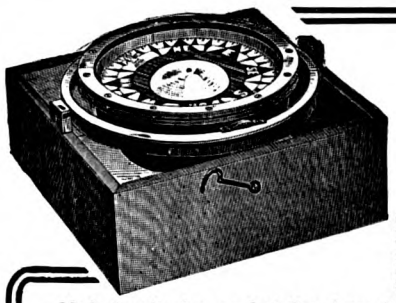
High Grades of Kiln Dried Woods for Cabin Work and Inside Trim

WHITE OAK TIMBERS AND PLANK

Constantly on Hand and Sawed to Order on Short Notice



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Made in all sizes and styles, from 2 to 12 inches diameter of card. All compasses made by us have our name printed below the North point or prominently upon the card. **None other are genuine.** Latest form with four or six needles, the best instrument for iron ships. For sale by ship chandlers and nautical instrument dealers. Catalogue free.

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We carry a complete stock of Dresses, Hose and Repair Sundries.

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As usual it will contain a correct list of captains and engineers on all lake vessels for the season of 1905.

Likewise

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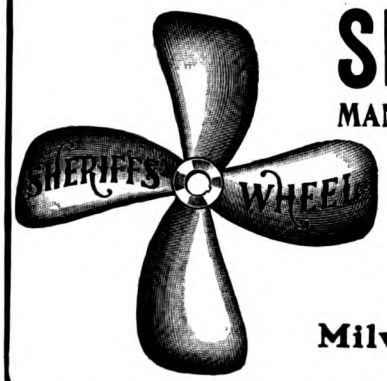

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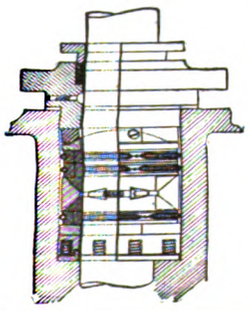

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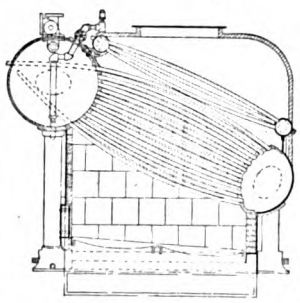

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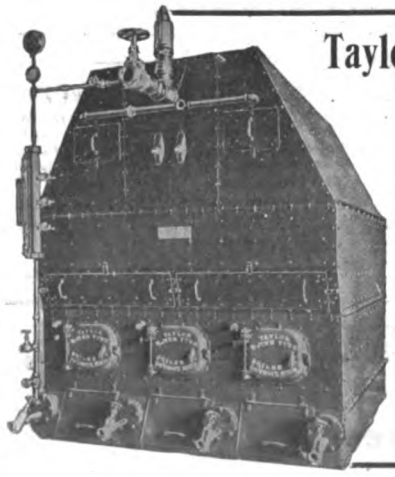

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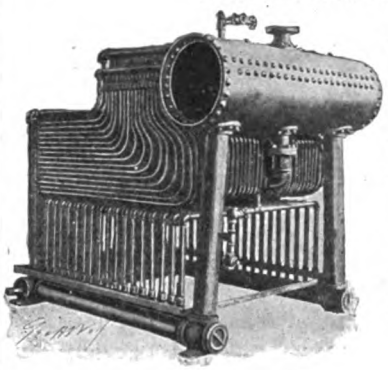
TRENTON, N. J.



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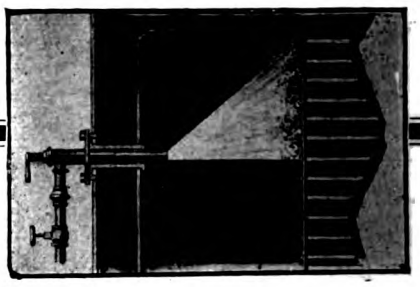

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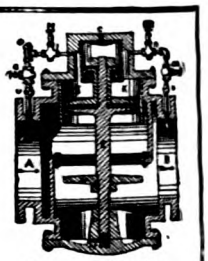

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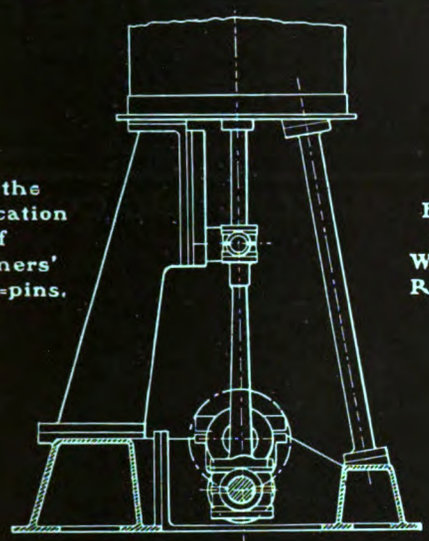
No. 1 MARINE ENGINE OIL

for the Lubrication of Steamers' Crank-pins.



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Eastward	Arrive from West	Depart East
No. 18, Southwestern Limited	.....	*1:50 a.m.
No. 22, Lake Shore Limited	*2:12 a.m.	*2:20 a.m.
No. 20, Chicago and Cleveland Exp.	*7:20 a.m.	.....
No. 28, New York and Boston Exp.	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom	†10:00 a.m.	†10:30 a.m.
No. 32, Fast Mail	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky	†1:40 p.m.	.....
No. 42, Boston-New York Express	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl.	.....	*3:00 p.m.
No. 46, Southwestern Express	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation	.....	†4:30 p.m.
No. 6, Limited Fast Mail	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl.	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation	†7:55 a.m.	.....

Westward	Arrive from East	Depart West
No. 7, Exposition Limited	*12:50 a.m.	.....
No. 11, Southwestern Limited	*2:55 a.m.	.....
No. 9, Day Express	.....	†6:00 a m.
No. 15, Boston and Chicago Special	*3:10 a.m.	*3:15 a.m.
No. 19, Lake Shore Limited	*7:15 a.m.	*7:25 a.m.
No. 23, Western Express	*10:30 a.m.	*10:35 a.m.
No. 29, Southwestern Special	‡11:10 a.m.	.....
No. 33, Southwestern Express	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp.	.....	*12:45 p.m.
No. 47, Accommodation	†11:00 a.m.	†3:00 p m.
No. 141, Sandusky Accommodation	.....	†3:10 p.m.
No. 43, Fast Mail	*4:35 p.m.	*4:40 p.m.
No. 127, Norwalk Accommodation	.....	†5:10 p.m.
No. 37, Pacific Express	*6:50 p.m.	*7:20 p.m.
No. 3, Fast Mail Limited	*10.50 p.m.	*10:55 p.m.
No 115, Ashtabula Accommodation	*8.30 a.m.	.....

*Daily. †Ex. Sunday. ‡Ex. Monday. Nos. 23, 28 and 37 run via Erie Station
City Ticket Office, 237 Superior St

Photograph showing one of two suspended tray elevators handling miscellaneous freight in warehouse of the Chicago, Milwaukee & St. Paul Ry. Co., Chicago, installed in 1887, and constantly operated for sixteen years, practically without repairs.

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Warehouses.

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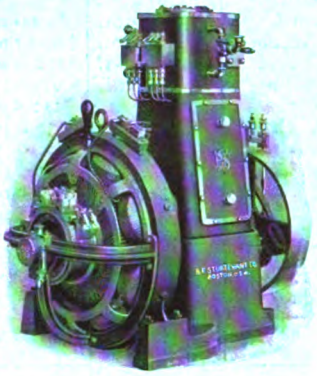
Sturtevant Generator Sets for Marine Lighting



Both units built to the Sturtevant Standard under the Sturtevant roof. Engine enclosed. Improved method of lubrication gives highest mechanical efficiency. Generator conservatively rated; heavy overload capacity; improved ventilation and low temperature rise. Full line of sizes from 3 to 250 K.W.

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Designers and builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus, Fans, Blowers and Exhausters, Steam Engines, Electric Motors and Generating Sets, Fuel Economizers, Forges, Exhaust Heads, Steam Traps, Etc. 431

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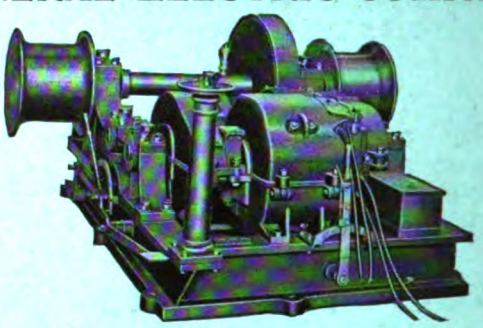

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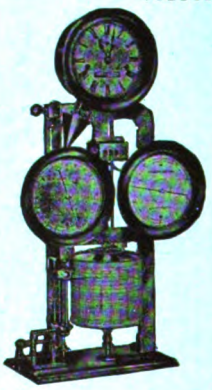

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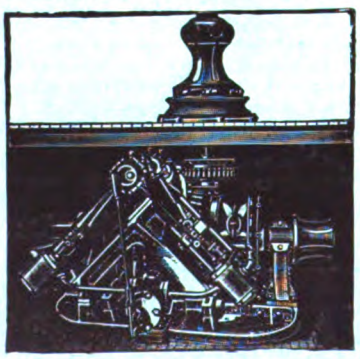

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